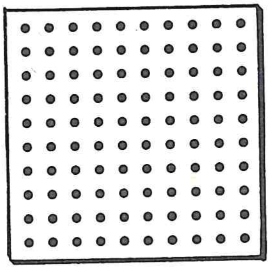
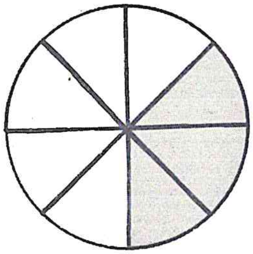
4

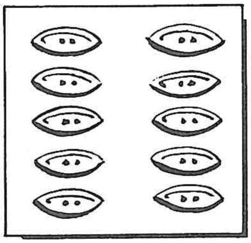
EXPLORING Arithmetic

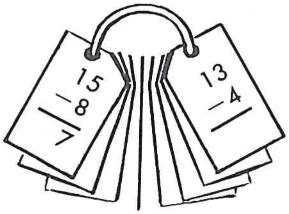
EXPLORING ARITHMETIC

Original Grade 4 Textbook
(Printed in 1957)





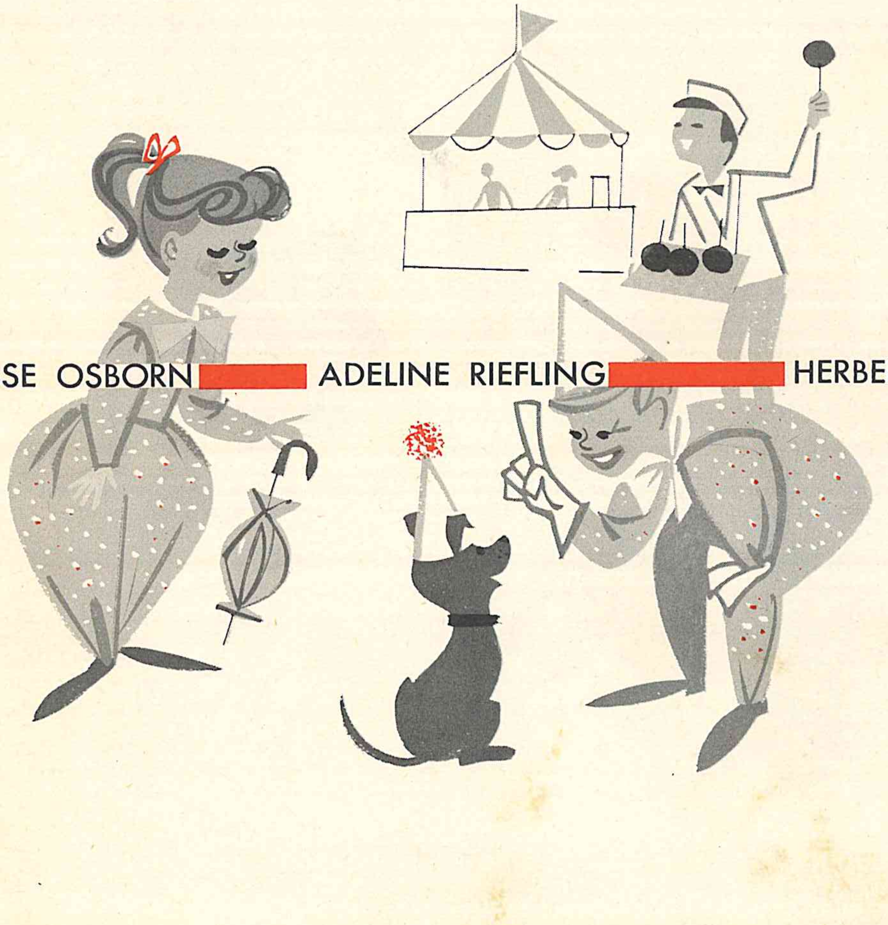




WEBSTER PUBLISHING COMPANY • ST. LOUIS • ATLANTA • DALLAS • PASADENA

EXPLORING

Arithmetic



ESSE OSBORN ADELINE RIEFLING HERBERT F. SPITZER

Illustrated by Jim Hicks and Obata and Associates

Library of Congress Catalog Card Number 57-5017

Copyright ©, 1957, by Webster Publishing Company

Printed in the United States of America

TABLE OF CONTENTS

UNIT ONE

1...28

The meaning of numbers
Reading and writing five-place numbers
Basic facts in addition
How to study addition facts
Adding two- and three-figure numbers
Changing ones to tens, tens to hundreds (carrying)
Adding by endings
Adding dollars and cents

UNIT TWO

29...54

Basic facts in subtraction
How to study subtraction facts
Subtracting two- and three-figure numbers
Changing tens to ones, hundreds to tens (borrowing)
Choosing the right number question
Subtracting dollars and cents
Zeros in subtraction

UNIT THREE

55...84

Basic facts in multiplication
How to study multiplication facts
Checking the answers to multiplication questions
Multiplying two- and three-figure numbers
Carrying in multiplication
Addition, subtraction, and multiplication problems

UNIT FOUR

85...108

Division facts for 2, 3, 4, and 5
How to study division facts
Checking the answer to division questions
Choosing the right number question
Division with a left-over part
Finding equal parts of a whole; of a group

UNIT FIVE
109...134
Division facts for 6, 7, and 8
Quotients with two and three figures
Checking division
The meaning and use of fractions
Changing fractions to equal fractions

UNIT SIX
135...160
Division facts for 9
Multiplying and dividing dollars and cents
Rounding numbers
Estimating answers
Ways of handling the left-over part in uneven division
Using measures of length, weight, and counting

UNIT SEVEN
161...184
Reading and writing six-place numbers
Roman numerals through fifty
Multiplying a four-place number
Practice in addition, subtraction, multiplication, and division

UNIT EIGHT
185...208
Multiplication with a two-figure multiplier
Checking longer multiplication
Using liquid and dry measures
Using measures of temperature and time

UNIT NINE
209...238
Choosing the correct number question
The meaning of average
Problems with two number questions
Practice in addition, subtraction, multiplication, and division

UNIT TEN
239...268
Zeros in the quotient
Practicing division
Using a three-figure multiplier
A zero at the end or within a three-figure multiplier
Adding like fractions

UNIT ELEVEN
269...292
Adding and subtracting like fractions
Understanding mixed numbers
Finding one of the equal parts of a number
Quotients that are mixed numbers
Thinking about the way to solve problems

UNIT TWELVE
293...320
Counting change
Longer measures of time
Fractions that are equal
Practice and problems that review the year's work

EXTRA PRACTICE
321...328
Important addition, subtraction, multiplication, and division facts
Practice exercises

SCHOOL

MIDLAND 21 MI.

Meaning of Two-Figure Numbers

These children ride this bus to the Midland School. Today Linda is going to school for the first time. She is eager to begin. She knows she will learn many things.

Linda has already learned to read a few words, and she can read the one-figure numbers. While all the children were waiting, Linda tried to read every word and number that she saw. Soon she asked, "What word is m-i?"

Linda's brother told her that mi. is a short way to write miles.

Then Linda tried to read the number on the sign. She said, "We will ride two and one miles to school."

1. How would you help Linda to understand that the two numbers mean twenty-one, not two and one?

Here are some of the things the other children said to Linda.

Bob said, "When a number has two figures, the figure at the right is ones. The figure at the left is tens."

Alice said, "The two in 21 is 2 tens, and 2 tens are the same as twenty. The number has two tens and one. That equals twenty-one."

Nancy said, "When you have more than nine, you have to use two figures."

2. Who do you think gave Linda the best answer?

3. Use Bob's explanation. Tell what each figure in these numbers means. 76 31 85

4. Use Alice's explanation. Tell what each of these numbers means.
17 64 99 26 30

5. Two-figure numbers like 61 and 34 have a tens part and a ones part. What is the tens part of 61? Of 34? What is the ones part of 36? Of 49? Of 72?

Different Ways to Show Amounts

Tom, Bob, and Pam are playing dominoes. In their score, they count only 5's, 10's, 15's, and so on. Here are the scores these players have made.

TOM ~~XXXXX~~ XXXX
BOB ~~XXXXX~~ XXX/
PAM ~~XXXXX~~ ~~XXXXX~~/

Each X stands for ten. One half X, or /, stands for five.

1. What is Tom's score? Bob's? Pam's?

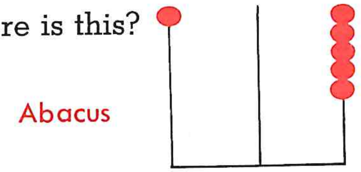
2. Whose score requires the most marks on the score sheet?

3. The domino score of each player is also shown on the place-value frame. Which is Bob's score?

Place-Value Frame		
hundreds	tens	ones
	///// ////	
	///// ///	/////
/		/////

4. Whose score on the place-value frame requires the fewest marks? Explain how the highest score can be shown with the fewest marks on the place-value frame.

5. The score of one of the players is shown on the abacus. Whose score is this?

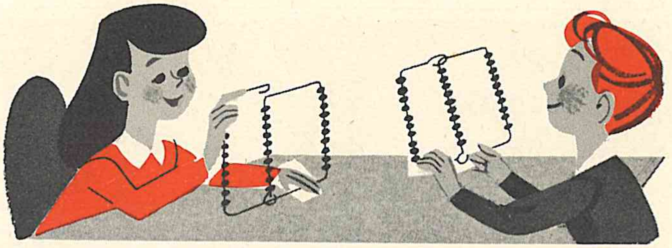


6. Whose score requires the most figures to write it? Use the number-reading chart below.

Number-Reading Chart			
thousands	hundreds	tens	ones
		9	0
		8	5
	1	0	5
2	8	0	6
3	0	5	0

7. When a score is even tens and no ones, what is in the ones place on the place-value frame? On the abacus? On the number-reading chart?

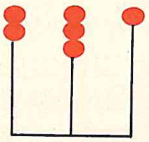
8. The tens part of 3050 is read fifty, and not five tens. Why?



Some Number Exercises

1. Draw a place-value frame. Show two hundred eight on the first line. Show seventy on the second line. Show three hundred on the third line. On the fourth line, show five hundred sixty-four.

2. This drawing of an abacus shows the number 231. Make 3 abacus drawings. Show the numbers 70, 604, and 310.



3. Think of numbers like 60, 20, and 70 on an abacus or a place-value frame. Is anything put in ones place?

4. When a number such as 70 is written in figures, why must a figure be written in ones place?

■ **Zero, used in numbers like 20 and 30, is a place-holder. If zero were not used in writing 20, we might think the 2 meant 2 ones.**

5. What place does the zero hold in the number 102?

6. What figure holds ones place in 23?

7. Write a number with the figure 1 in tens place.

8. Write a number with the figure 1 in thousands place.

Use figures. Write the following numbers.

9. Eight tens and seven ones.

10. Four hundreds and three ones.

11. The number that is 2 tens more than 8 tens and 3 ones.

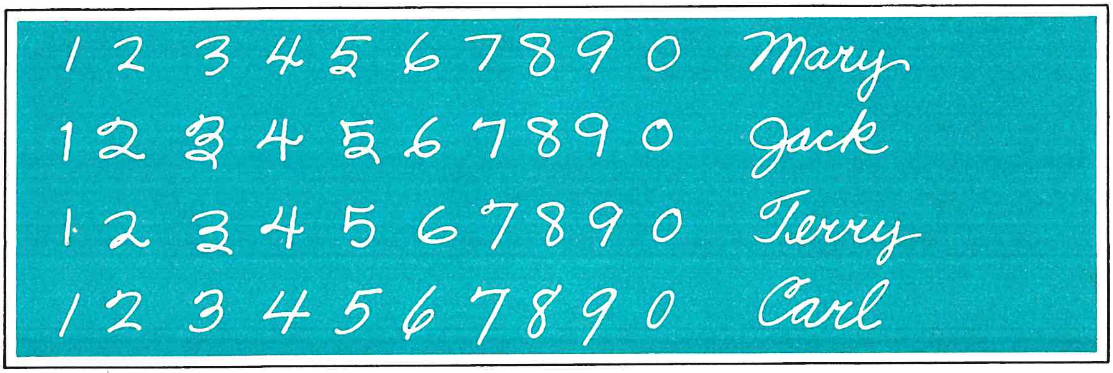
■ **You can write any number you want using only these ten figures:**

1, 2, 3, 4, 5, 6, 7, 8, 9, 0

12. In some numbers, you use the same figure more than once, as in 888. Look at the number-reading chart on page 2. Tell what each 8 in 888 means.

■ **The value of a figure depends on the place that the figure holds in the number. That is, a figure means ones, tens, or hundreds according to the place of a figure in a number.**

Write the figures 1 through 0 six times on a sheet of paper. Date your paper. Have your teacher keep this paper for you.



Writing and Reading Numbers

1. Who wrote the best row of figures on the blackboard above?

2. Who made the best 5? The best 8? The poorest 8? The poorest 5?

3. Who wrote the poorest row of figures? Why do you think so?

4. Look at the six copies of the numbers that you wrote. (See page 3.) Which row of your figures is written best? Which figure did you write best? Which is your poorest figure?

5. You can improve your writing of numbers. Look at the figures at the bottom of this page. Where do you start in writing each figure?

Practice writing good figures. In a few days give your teacher another sample of your best written figures to keep for you. Do you think you are improving?

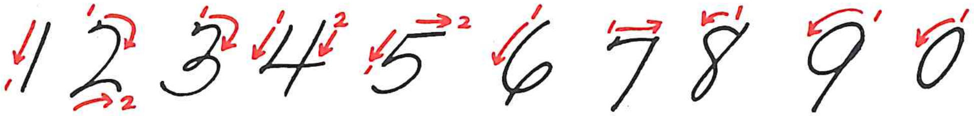
6. Bob saw the number 27,000 in his geography. He could not read it. He put the figures on a number-reading chart. Then he read, "2 ten thousand 7 thousand." Why was Bob's reading wrong?

Think: What is the shortest way to read 27? Would you say 2 tens and 7 ones?

ten thousands	thousands	hundreds	tens	ones
2	7	0	0	0

7. Read the following numbers. If you need help, make a number-reading chart.

9,856 60,310 75,006 54,100
24,040 83,299 43,002 35,423
98,551 16,070 29,000 50,802



Short Ways of Saying Longer Numbers

On page 4 you learned one way to read long numbers. Sometimes numbers are read in other ways.

The teacher said Columbus discovered America in fourteen ninety-two. Jerry did not understand this number.

Then his teacher told him that the year was also read as one thousand four hundred ninety-two (1492). She said the year is often given by saying the hundreds together — fourteen (14—). Then the tens and ones are said together — ninety-two (1492).

1. Which way is the shorter way to read or say a given year?

2. Read these years using the short way.

1957 1775 1619 1861 1960

Bill told Sue that he lived at sixty-five twenty-three Elm Street. Sue asked him to write his house number. He wrote this.

6523 Elm Street

House numbers can be read in a short way just as years are often read. Say the hundreds together, as 6523. Then say the tens and ones together, as 6523.

3. Use Bill's way. Read these house numbers in addresses.

3128 Oak Drive 816 Rose Lane
4412 Main St. 4238 Poe Ave.

4. Jack lives at 2301 Circle Drive. He says his house number is twenty-three oh one. Is this a correct way to say this number?

■ **If there are ones, but no tens in a house number, the zero in tens place is read "oh."**

5. Read the house numbers in these addresses as Jack did.

3402 Olive Street 5003 Park Lane
6209 River Drive 2405 Glen Road

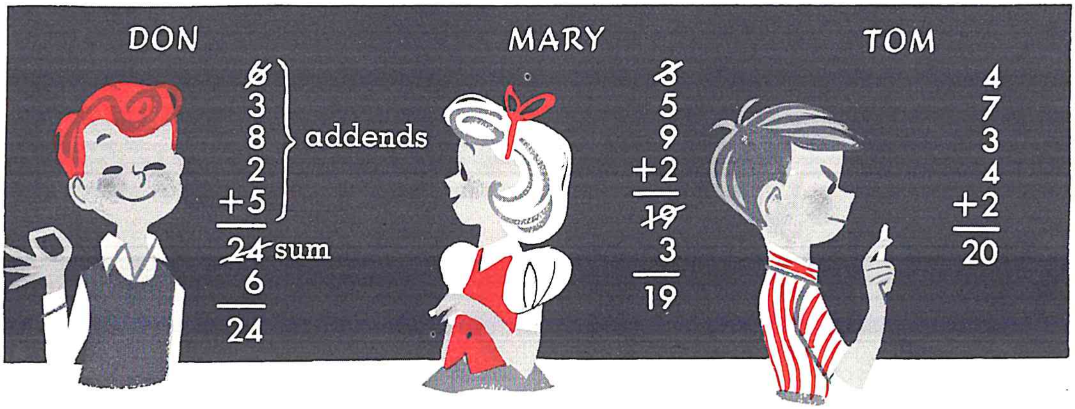
House numbers and telephone numbers are often read by saying each number. Tom's telephone number is Lake 4-3020. He says "oh" for every zero. Tom gives his telephone number in this way.

Lake four - three oh two oh.

6. Read these telephone numbers as Tom reads his.

Upton 7-4056 Evergreen 9-4260
Main 3-1020 Central 5-4903

7. Read the house numbers given on this page using Tom's way of saying each number.



The Mark-Out Check in Addition

The board shows three addition examples. Don and Mary have used the mark-out check. Tom has not yet checked his addition.

1. Can you figure out how the mark-out check works?

2. Which numbers did Don mark out? Then what number did he write? What numbers did he add when he added a second time? How can he tell if his sum is correct?

3. Explain Mary's mark-out check.

4. When Tom uses the mark-out check on his addition example, what numbers will he mark out?

■ **In the mark-out check, mark out the top figure in the column. Then mark out the sum. Next write the top figure below the marked-out sum. Add again, skipping the numbers that are marked out.**

5. Why is the mark-out check a better check than just adding the numbers a second time?

6. Copy Tom's addition. Check his sum by using the mark-out check.

▶ Find the sums. Check by using the mark-out check.

7.

5	6	2	3
3	8	9	8
4	9	8	4
2	3	4	5
+5	+1	+7	+5

8.

28	56	47	19
34	38	64	39
+16	+42	+38	+54

9.

54	48	29	36
25	61	76	52
+68	+34	+95	+79

Basic Addition Questions and Facts

The mark-out check sometimes shows that there are children who do not add very well. This is because they have forgotten the answers to some of the basic addition questions.

See if you can answer each of these basic addition questions as soon as you glance at it.

1. $\begin{array}{r}5\\+8\\\hline\end{array}$ $\begin{array}{r}4\\+8\\\hline\end{array}$ $\begin{array}{r}7\\+9\\\hline\end{array}$ $\begin{array}{r}8\\+3\\\hline\end{array}$ $\begin{array}{r}5\\+7\\\hline\end{array}$ $\begin{array}{r}6\\+9\\\hline\end{array}$

2. $\begin{array}{r}4\\+7\\\hline\end{array}$ $\begin{array}{r}4\\+9\\\hline\end{array}$ $\begin{array}{r}9\\+6\\\hline\end{array}$ $\begin{array}{r}9\\+7\\\hline\end{array}$ $\begin{array}{r}5\\+7\\\hline\end{array}$ $\begin{array}{r}8\\+9\\\hline\end{array}$

3. $\begin{array}{r}8\\+4\\\hline\end{array}$ $\begin{array}{r}5\\+6\\\hline\end{array}$ $\begin{array}{r}9\\+9\\\hline\end{array}$ $\begin{array}{r}6\\+6\\\hline\end{array}$ $\begin{array}{r}3\\+8\\\hline\end{array}$ $\begin{array}{r}7\\+7\\\hline\end{array}$

4. $\begin{array}{r}6\\+5\\\hline\end{array}$ $\begin{array}{r}2\\+9\\\hline\end{array}$ $\begin{array}{r}6\\+8\\\hline\end{array}$ $\begin{array}{r}8\\+7\\\hline\end{array}$ $\begin{array}{r}9\\+8\\\hline\end{array}$ $\begin{array}{r}3\\+5\\\hline\end{array}$

5. $\begin{array}{r}9\\+2\\\hline\end{array}$ $\begin{array}{r}9\\+4\\\hline\end{array}$ $\begin{array}{r}5\\+9\\\hline\end{array}$ $\begin{array}{r}7\\+4\\\hline\end{array}$ $\begin{array}{r}7\\+8\\\hline\end{array}$ $\begin{array}{r}9\\+5\\\hline\end{array}$

6. $\begin{array}{r}7\\+6\\\hline\end{array}$ $\begin{array}{r}9\\+3\\\hline\end{array}$ $\begin{array}{r}8\\+6\\\hline\end{array}$ $\begin{array}{r}6\\+7\\\hline\end{array}$ $\begin{array}{r}7\\+5\\\hline\end{array}$ $\begin{array}{r}8\\+5\\\hline\end{array}$

7. Could you answer each question as soon as you glanced at it? If not, study the addition fact for each question you could not answer quickly. You will find all of the basic addition facts given on page 321.

- **Basic addition questions ask you to add a one-figure number to another one-figure number.**

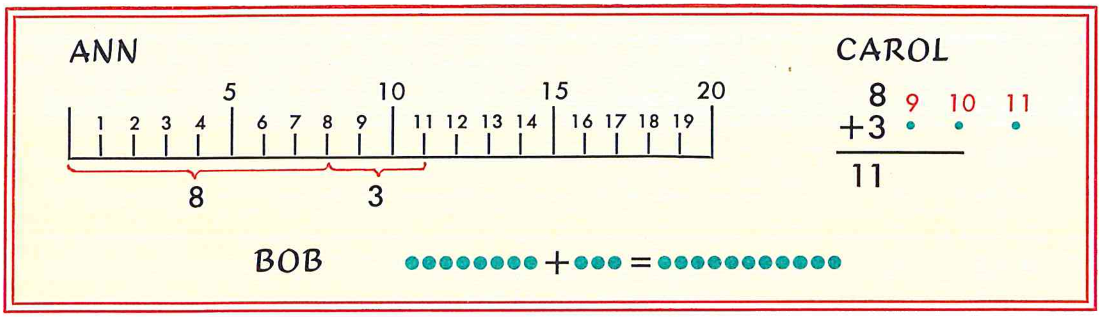
- **A basic addition question with its answer is called a basic addition fact.**

An addition fact may be written $\begin{array}{r}5\\+4\\\hline 9\end{array}$ or $5+4=9$.

How to Study Addition Facts

- Read the fact carefully. For the fact $\begin{array}{r}5\\+8\\\hline 13\end{array}$ say, "5 and 8 = 13."
- Then close your eyes. Think the fact.
- Open your eyes. See if the fact is exactly as you thought it. If not, read and study the fact again.

- Write correctly all the facts that are giving you trouble.
- Cover the sum part of a fact. Try to give the sum.
- Then uncover the sum to see if you were right.



Studying Addition

"Just thinking the answer in addition is very good," the teacher said. "But we had better make sure that we know what we are doing. Who can show in different ways that the answer to 8 and 3 = 11 is correct?"

1. Three ways of showing that 8 and 3 = 11 are shown at the top of the page. How do you think Ann thought when she did her work? How did Bob think? How did Carol think?

2. When you add two numbers such as 8 and 3, you think them together as one number. Whose work above best shows this putting two numbers together?

Find the answers to the following addition questions. Use dot drawings as Bob did.

3. 7 + 5 = ?
4. 9 + 4 = ?
5. 2 + 9 = ?

Find the answers to the following addition questions. Use the number line as Ann did.

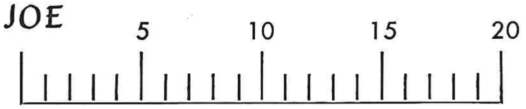
6. 4 and 7 = ?
7. 3 and 9 = ?
8. 8 and 8 = ?

Find the answers to the following addition questions. Use counting as Carol did.

9. $\begin{array}{r}7\\+6\\\hline\end{array}$ 10. $\begin{array}{r}8\\+4\\\hline\end{array}$ 11. $\begin{array}{r}6\\+6\\\hline\end{array}$

■ **When you add numbers such as 8 and 3, you think and put them together.**

Some children like to number each space on the number line as Ann did. Other children number every five spaces, as Joe shows here. Use the way you like better.



Playing Follow Me

The teacher said, "The bell will not ring for a few more minutes. Let us use those minutes and play Follow Me."

Then she said, "Add 6 and 4. Then take away 5. Double what you have left. Add 3. Take away 4. Where are we?"

1. John said they were at 10. Bill said, "11." Nan said, "9." Who was right?

Play the game Follow Me. Here are some exercises to use in the game. Try them.

2. Add 6, 3, 2, and 4. Then take away 3. Take away 5 more. Add 8. Subtract 5.

3. To 8 add 7. Take away 3. Double what you have left. Subtract 5.

4. Put 6, 3, and 5 together. Take away 4. Take away 2. Then add 8.

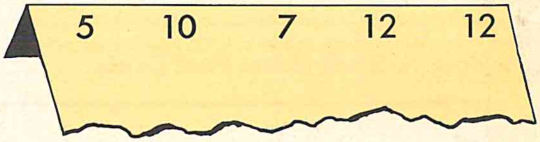
5. Make up exercises for Follow Me. The numbers you give to be added or subtracted should be one-figure numbers. Some answers will be two-figure numbers, but that is all right.

When you ask your followers to double, the number they are doubling should be a one-figure number. Be sure you can do your own exercises.

Addition Practice

You can save time in addition practice if you use a folded paper. Place each fold under a row of examples. Write the sum for each example in the proper place on the folded paper.

1.	2 +3	9 +1	3 +4	5 +7	8 +4



2.	9 +6	8 +8	2 +2	9 +8	8 +3
3.	8 +2	6 +6	2 +5	4 +3	5 +3
4.	2 +7	4 +4	7 +5	9 +9	7 +7
5.	3 +2	8 +7	4 +8	7 +3	4 +6
6.	9 +3	5 +4	9 +4	8 +6	5 +5
7.	3 +6	4 +7	8 +5	9 +2	5 +6
8.	9 +7	2 +4	6 +7	3 +3	9 +5

Cards That Help You Study Addition

A good way to study addition is to use basic fact cards. A basic fact card is pictured at the right.

1. What is written on the front of the card? On the back?

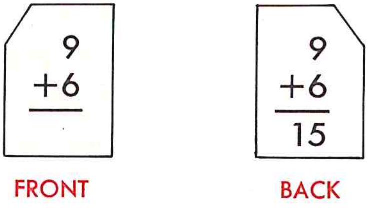
2. How does the cut-off corner help when you are using the cards?

Make a basic fact card for each addition fact on page 321. Study the addition facts in this way.

How to Study Basic Fact Cards

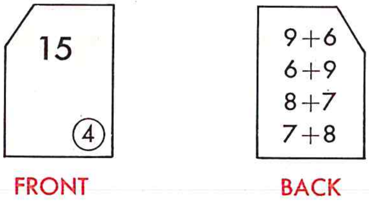
- Stack all your addition fact cards so that the cut-off corners are at the left.
- Try to give the sum that belongs on the first card.
- Turn the card to the fact side. See if your sum is correct.
- If your sum is not correct, read the whole fact. Close your eyes. Think the whole fact. Open your eyes. Look to see if the fact is just as you thought it. Put this card in your Must Study stack.
- Go through the whole stack of basic fact cards.
- Then do all the cards in the Must Study stack again.

Basic Addition Fact Card



Another kind of card that may be used in studying addition facts is the basic sum card. The large number on the front of the card is the sum. The small number tells how many basic addition facts have the sum shown by the large number.

Basic Sum Card



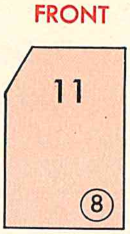
3. What is shown on the back of the basic sum card?

4. If the large number on the front of the basic sum card shown above was 16, how would the rest of the card be written?

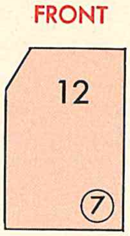
Because adding 1 to a number is so easy, 1 is not included with the pairs of numbers on the back of the card.

Make basic sum cards for 11, 12, 13, 14, 15, 16, 17, and 18. The pictures at the right show how the front and back of some of them will look.

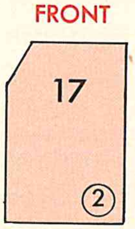
Study your basic sum cards in this way.



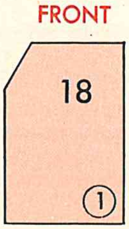
9+2
2+9
8+3
3+8
7+4
4+7
6+5
5+6



9+3
3+9
8+4
4+8
7+5
5+7
6+6



9+8
8+9



9+9

How to Study Basic Sum Cards

- Look at each sum. Try to give all the pairs of numbers that make that sum.
- Turn the card and check.
- Make a Must Study stack of the cards you do not know well.

Test on Some Basic Addition Facts

▶ Use folded paper. Write the answers quickly. When you have finished, use page 321 to check your work.

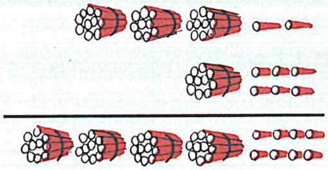
1.	9 +4	6 +7	9 +5	4 +9	7 +5	4 +7
2.	8 +6	8 +9	5 +8	9 +7	6 +8	6 +9
3.	5 +7	7 +8	9 +6	8 +5	3 +3	8 +2
4.	2 +2	5 +4	5 +5	4 +3	3 +2	2 +8
5.	4 +4	2 +5	6 +4	4 +5	2 +4	4 +6
6.	3 +6	6 +2	7 +2	5 +3	5 +2	2 +7
7.	7 +3	3 +5	2 +3	3 +4	2 +6	3 +7
8.	8 +8	9 +2	8 +3	6 +6	2 +9	8 +7
9.	9 +9	7 +6	9 +8	9 +3	7 +7	6 +5
10.	3 +8	3 +9	8 +4	4 +8	5 +9	7 +9

TOM

First Way

3 tens 2 ones
+1 ten 6 ones
4 tens 8 ones or 48

Second Way



Third Way

$32+16=32+10+6=48$

Adding Two-Figure Numbers

Tom caught two fish. One weighed 32 pounds. The other weighed 16 pounds. Tom told Bill that the two fish together weighed 48 pounds.

Bill did not think that amount was right. Tom used the three ways given above to show that 48 was the right answer.

1. Tell how you think Tom thought in each of the three ways.

2. Jane said there were 23 red pencils and 35 green pencils in the pencil box. How many pencils were there in all?

Jane's way of finding the answer is given below. She added ones first. Then she added tens.

JANE

tens
ones

$$\begin{array}{r} 23 \\ +35 \\ \hline 58 \end{array}$$

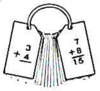
Check Jane's addition by using Tom's third way.

Use folded paper. Find the answers.

3.	13 +34	41 +53	62 +17	44 +15
4.	24 +62	35 +24	16 +13	43 +42
5.	34 +23	62 +14	75 +21	82 +15
6.	13 +72	40 +28	17 +40	73 +24
7.	61 +21	25 +34	14 +64	23 +22

8. Use Tom's second way. Check your sums for row 3 above.

9. Use Tom's third way. Check your sums for row 6 above.



Put your addition fact cards on a notebook ring. This makes a "merry-go-round." See how fast you can go on the "merry-go-round," giving answers to the addition questions.

Carrying in Addition

ANN $\begin{array}{r}38\\+45\\\hline\end{array} = \begin{array}{rr}3\text{ tens} & 8\text{ ones}\\+4\text{ tens} & 5\text{ ones}\\\hline 7\text{ tens} & 13\text{ ones}\end{array} = 8\text{ tens } 3\text{ ones} = 83$

1. Ann made 38 pieces of coconut candy. Joan made 45 pieces of chocolate candy. Ann said that together they had 83 pieces of candy.

Look at Ann's addition. What did she do when her sum had 13 ones in ones place?

2. Use bundles of ten as Tom did. Show how many pieces of candy Ann and Joan made in all.

▶ Use bundles-of-ten drawings. Find the answers to the following number questions.

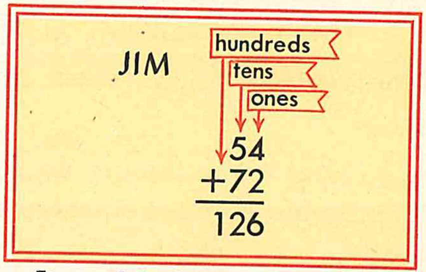
3. $\begin{array}{r}25\\+35\\\hline\end{array}$ $\begin{array}{r}16\\+57\\\hline\end{array}$ $\begin{array}{r}36\\+36\\\hline\end{array}$ $\begin{array}{r}24\\+65\\\hline\end{array}$

4. $\begin{array}{r}74\\+18\\\hline\end{array}$ $\begin{array}{r}48\\+36\\\hline\end{array}$ $\begin{array}{r}28\\+55\\\hline\end{array}$ $\begin{array}{r}53\\+38\\\hline\end{array}$

5. $\begin{array}{r}59\\+28\\\hline\end{array}$ $\begin{array}{r}62\\+29\\\hline\end{array}$ $\begin{array}{r}71\\+33\\\hline\end{array}$ $\begin{array}{r}16\\+25\\\hline\end{array}$

■ **When the sum of the ones figures is ten, or more, change the 10 ones to 1 ten. Add the ten with the tens figures. This is called carrying to tens place.**

6. Jim sold 54 newspapers today and 72 yesterday. He said he sold 126 newspapers in the two days. Look at Jim's work.



When Jim added ones, how many ones did he get? How many tens did he get when he added tens?

7. As Jim added, he thought, "Ten 10's = 100." How did he show this in his sum?

8. Use drawings of bundles of ten. Show that 45 + 76 = 121.

▶ Find the sums. Carry when you have enough ones to make a ten. Write a figure in hundreds place when you have enough tens to make a hundred.

9. $\begin{array}{r}16\\+94\\\hline\end{array}$ $\begin{array}{r}24\\+77\\\hline\end{array}$ $\begin{array}{r}89\\+36\\\hline\end{array}$ $\begin{array}{r}58\\+35\\\hline\end{array}$

10. $\begin{array}{r}34\\41\\+53\\\hline\end{array}$ $\begin{array}{r}13\\26\\+31\\\hline\end{array}$ $\begin{array}{r}21\\53\\+42\\\hline\end{array}$ $\begin{array}{r}54\\17\\+32\\\hline\end{array}$

11. $\begin{array}{r}25\\+96\\\hline\end{array}$ $\begin{array}{r}76\\+35\\\hline\end{array}$ $\begin{array}{r}35\\+52\\\hline\end{array}$ $\begin{array}{r}49\\+73\\\hline\end{array}$

Are You Sure You Remember?

When you see No Pencils, Please! you are to do the work in your mind and say the answer.

No Pencils, Please!

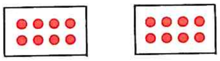
1. What number has a three in tens place and a seven in ones place?

2. How many figures do you use to write the number equal to twelve tens?

3. Count by 2's from 2 to 40.

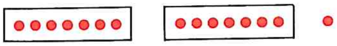
4. Count by 2's from 38 to 100.

5. How does this drawing show that 16 is an even number?

16 = 

6. Say the even numbers between 84 and 92.

7. How does this drawing show that 15 is an odd number?

15 = 

8. Say the odd numbers from 1 through 15. If you are not sure which numbers are odd, use dot drawings.

9. How many marks are needed on a place-value chart to show two hundred?

10. How many bundles of ten must you draw to show sixty?

▶ Write the sums on folded paper.

11. $\begin{array}{r} 36 \\ +41 \\ \hline \end{array} \qquad \begin{array}{r} 16 \\ +34 \\ \hline \end{array} \qquad \begin{array}{r} 18 \\ +96 \\ \hline \end{array} \qquad \begin{array}{r} 29 \\ +32 \\ \hline \end{array}$

12. $\begin{array}{r} 38 \\ +71 \\ \hline \end{array} \qquad \begin{array}{r} 53 \\ +39 \\ \hline \end{array} \qquad \begin{array}{r} 47 \\ +74 \\ \hline \end{array} \qquad \begin{array}{r} 21 \\ +85 \\ \hline \end{array}$

13. $\begin{array}{r} 36 \\ +28 \\ \hline \end{array} \qquad \begin{array}{r} 61 \\ +83 \\ \hline \end{array} \qquad \begin{array}{r} 49 \\ +57 \\ \hline \end{array} \qquad \begin{array}{r} 28 \\ +96 \\ \hline \end{array}$

14. $\begin{array}{r} 14 \\ 35 \\ +26 \\ \hline \end{array} \qquad \begin{array}{r} 27 \\ 56 \\ +41 \\ \hline \end{array} \qquad \begin{array}{r} 35 \\ 42 \\ +25 \\ \hline \end{array} \qquad \begin{array}{r} 52 \\ 67 \\ +46 \\ \hline \end{array}$

15. $\begin{array}{r} 45 \\ +46 \\ \hline \end{array} \qquad \begin{array}{r} 53 \\ +92 \\ \hline \end{array} \qquad \begin{array}{r} 73 \\ +58 \\ \hline \end{array} \qquad \begin{array}{r} 64 \\ 46 \\ +53 \\ \hline \end{array}$

▶ Copy. Find the sums. Check by using the mark-out check.

16. $\begin{array}{r} 23 \\ 58 \\ +46 \\ \hline \end{array} \qquad \begin{array}{r} 56 \\ 31 \\ +54 \\ \hline \end{array} \qquad \begin{array}{r} 73 \\ 25 \\ +23 \\ \hline \end{array} \qquad \begin{array}{r} 32 \\ 62 \\ +33 \\ \hline \end{array}$

17. $\begin{array}{r} 31 \\ 23 \\ 14 \\ +21 \\ \hline \end{array} \qquad \begin{array}{r} 24 \\ 41 \\ 32 \\ +32 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ 52 \\ 26 \\ +19 \\ \hline \end{array} \qquad \begin{array}{r} 52 \\ 25 \\ 15 \\ +11 \\ \hline \end{array}$

18. $\begin{array}{r} 22 \\ 45 \\ 78 \\ +25 \\ \hline \end{array} \qquad \begin{array}{r} 36 \\ 31 \\ 31 \\ +42 \\ \hline \end{array} \qquad \begin{array}{r} 36 \\ 12 \\ 42 \\ +21 \\ \hline \end{array} \qquad \begin{array}{r} 19 \\ 13 \\ 23 \\ +14 \\ \hline \end{array}$

Adding Three-Figure Numbers

1. In one month Gary read three books. He began to add to find how many pages he had read. He could not finish his addition. How would you help him?

2. Bob began to work Gary's problem in this way.

BOB

$$\begin{array}{r} 200 \\ 300 \\ +200 \\ \hline 700 \end{array} \qquad \begin{array}{r} 87 \\ 12 \\ +20 \\ \hline 119 \end{array}$$

What should Bob do next?

3. Ann began to do Gary's problem in this way.

ANN

$$\begin{array}{rr} 2 \text{ hundreds} & 8 \text{ tens } 7 \text{ ones} \\ 3 \text{ hundreds} & 1 \text{ ten } \ 2 \text{ ones} \\ +2 \text{ hundreds} & 2 \text{ tens } 0 \text{ ones} \\ \hline 7 \text{ hundreds} & 11 \text{ tens } 9 \text{ ones} \end{array}$$

What should Ann do next?

4. Copy and finish the addition shown on Gary's reading record.

5. How many pages did Sue read in all? Add as Gary is doing.

OUR READING RECORDS

GARY	SUE	JANE	DON
287	226	225	95
312	231	300	350
+220	+272	+190	+274
19		715	719

6. Tell how Jane thought when she found 715 as her sum.

7. What did Don think when he found the 7 in his sum?

8. Add these three-figure numbers. Then try to write a statement telling how to carry tens.

$$\begin{array}{r} 365 \\ +242 \\ \hline \end{array} \qquad \begin{array}{r} 472 \\ +156 \\ \hline \end{array} \qquad \begin{array}{r} 241 \\ +985 \\ \hline \end{array} \qquad \begin{array}{r} 534 \\ +792 \\ \hline \end{array}$$

▶ Use folded paper. Write the sums.

9.
$$\begin{array}{r} 132 \\ +485 \\ \hline \end{array} \qquad \begin{array}{r} 243 \\ +394 \\ \hline \end{array} \qquad \begin{array}{r} 392 \\ +576 \\ \hline \end{array} \qquad \begin{array}{r} 741 \\ +685 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 875 \\ +762 \\ \hline \end{array} \qquad \begin{array}{r} 360 \\ +590 \\ \hline \end{array} \qquad \begin{array}{r} 435 \\ +583 \\ \hline \end{array} \qquad \begin{array}{r} 750 \\ +497 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 252 \\ 350 \\ +743 \\ \hline \end{array} \qquad \begin{array}{r} 145 \\ 672 \\ +910 \\ \hline \end{array} \qquad \begin{array}{r} 243 \\ 195 \\ +500 \\ \hline \end{array} \qquad \begin{array}{r} 451 \\ 200 \\ +896 \\ \hline \end{array}$$

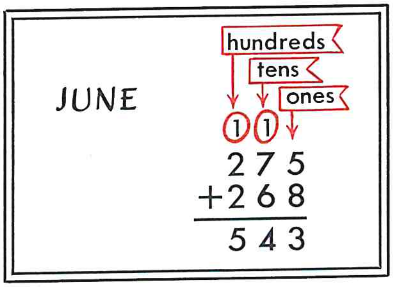
12.
$$\begin{array}{r} 241 \\ 394 \\ +403 \\ \hline \end{array} \qquad \begin{array}{r} 362 \\ 381 \\ +700 \\ \hline \end{array} \qquad \begin{array}{r} 164 \\ 582 \\ +964 \\ \hline \end{array} \qquad \begin{array}{r} 195 \\ 653 \\ +371 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 612 \\ +892 \\ \hline \end{array} \qquad \begin{array}{r} 294 \\ +854 \\ \hline \end{array} \qquad \begin{array}{r} 902 \\ 380 \\ +195 \\ \hline \end{array} \qquad \begin{array}{r} 263 \\ 251 \\ +915 \\ \hline \end{array}$$

Carrying Twice in Addition

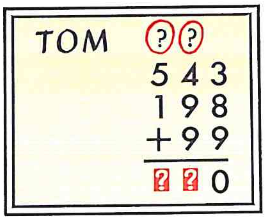
June said that 275 children's tickets and 268 adults' tickets had been sold for the school entertainment. She said 543 tickets had been sold in all.

1. Look at June's addition. How did she get the 1 in the circle at the top of tens column? At the top of hundreds column?



2. At the end of the week, Tom counted the tickets that had been sold. He said that besides the 543 tickets that June counted, 198 children's tickets and 99 adults' tickets had been sold. How many had been sold in all?

Copy and finish Tom's addition.



How many tens did you carry to tens column? How many hundreds did you carry to hundreds column?

■ **Sometimes you carry twice in addition.**

■ **When the sum of ones figures equals 10, or more, carry the ten or tens to tens column.**

■ **When the sum of tens figures equals 100, or more, carry the hundred or hundreds to hundreds column.**

▶ Copy. Find the sums.

3. $\begin{array}{r}574\\+149\\\hline\end{array}$ $\begin{array}{r}486\\+238\\\hline\end{array}$ $\begin{array}{r}397\\+374\\\hline\end{array}$ $\begin{array}{r}652\\+298\\\hline\end{array}$

4. $\begin{array}{r}246\\+596\\\hline\end{array}$ $\begin{array}{r}548\\+884\\\hline\end{array}$ $\begin{array}{r}297\\+963\\\hline\end{array}$ $\begin{array}{r}389\\+495\\\hline\end{array}$

5. $\begin{array}{r}975\\406\\+57\\\hline\end{array}$ $\begin{array}{r}542\\87\\+135\\\hline\end{array}$ $\begin{array}{r}863\\380\\+9\\\hline\end{array}$ $\begin{array}{r}209\\8\\+799\\\hline\end{array}$

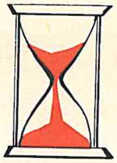
6. $\begin{array}{r}308\\975\\+685\\\hline\end{array}$ $\begin{array}{r}59\\849\\+736\\\hline\end{array}$ $\begin{array}{r}421\\598\\+9\\\hline\end{array}$ $\begin{array}{r}897\\86\\+8\\\hline\end{array}$

7. $\begin{array}{r}358\\+867\\\hline\end{array}$ $\begin{array}{r}146\\+789\\\hline\end{array}$ $\begin{array}{r}725\\+156\\\hline\end{array}$ $\begin{array}{r}9\\+197\\\hline\end{array}$

▶ Copy in straight columns. Add.

8. 635, 79, 475
9. 69, 804, 683
10. 9, 843, 96
11. 709, 908, 87
12. 129, 872, 4
13. 500, 299, 578

Measuring Improvement—Test 1



Find out how well you can add. The teacher will tell you when to begin and when to stop.

It can be more fun if you have a 3-minute sandglass timer. Begin when you turn the timer. Be finished before the last grain of sand runs out.

Use folded paper. Write the sums.

1. $\begin{array}{r}9\\+6\\\hline\end{array}$ $\begin{array}{r}5\\+8\\\hline\end{array}$ $\begin{array}{r}4\\+8\\\hline\end{array}$ $\begin{array}{r}8\\+9\\\hline\end{array}$ $\begin{array}{r}8\\+4\\\hline\end{array}$

2. $\begin{array}{r}9\\+9\\\hline\end{array}$ $\begin{array}{r}6\\+6\\\hline\end{array}$ $\begin{array}{r}3\\+8\\\hline\end{array}$ $\begin{array}{r}7\\+7\\\hline\end{array}$ $\begin{array}{r}9\\+7\\\hline\end{array}$

3. $\begin{array}{r}6\\+8\\\hline\end{array}$ $\begin{array}{r}8\\+7\\\hline\end{array}$ $\begin{array}{r}9\\+8\\\hline\end{array}$ $\begin{array}{r}3\\+9\\\hline\end{array}$ $\begin{array}{r}9\\+2\\\hline\end{array}$

4. $\begin{array}{r}26\\+13\\\hline\end{array}$ $\begin{array}{r}32\\+17\\\hline\end{array}$ $\begin{array}{r}41\\+32\\\hline\end{array}$ $\begin{array}{r}63\\+55\\\hline\end{array}$

5. $\begin{array}{r}27\\+58\\\hline\end{array}$ $\begin{array}{r}47\\+56\\\hline\end{array}$ $\begin{array}{r}38\\+44\\\hline\end{array}$ $\begin{array}{r}40\\+69\\\hline\end{array}$

6. $\begin{array}{r}38\\+84\\\hline\end{array}$ $\begin{array}{r}96\\+49\\\hline\end{array}$ $\begin{array}{r}56\\+95\\\hline\end{array}$ $\begin{array}{r}39\\+82\\\hline\end{array}$

7. $\begin{array}{r}26\\+34\\\hline\end{array}$ $\begin{array}{r}29\\+61\\\hline\end{array}$ $\begin{array}{r}56\\+35\\\hline\end{array}$

8. $\begin{array}{r}32\\+29\\\hline\end{array}$ $\begin{array}{r}23\\+48\\\hline\end{array}$

Check your answers. Write on your paper the number you answered correctly, the number of minutes you took, and the date.

Call your paper "Improvement Test 1." Keep this test.

Things to Help You Improve

1. Turn to page 322. Write the sums on folded paper. Use page 321 to check your answers. Study any facts you missed. Page 7 will help you.

2. Use your basic fact and basic sum cards. Study them in the ways given on pages 10 and 11.

See how quickly you can say the sums.

3. $\begin{array}{r}1\\+8\\\hline\end{array}$ $\begin{array}{r}4\\+1\\\hline\end{array}$ $\begin{array}{r}1\\+7\\\hline\end{array}$ $\begin{array}{r}5\\+1\\\hline\end{array}$ $\begin{array}{r}9\\+1\\\hline\end{array}$

4. $\begin{array}{r}6\\+1\\\hline\end{array}$ $\begin{array}{r}1\\+3\\\hline\end{array}$ $\begin{array}{r}2\\+1\\\hline\end{array}$ $\begin{array}{r}0\\+7\\\hline\end{array}$ $\begin{array}{r}0\\+2\\\hline\end{array}$

5. $\begin{array}{r}5\\+0\\\hline\end{array}$ $\begin{array}{r}0\\+3\\\hline\end{array}$ $\begin{array}{r}8\\+0\\\hline\end{array}$ $\begin{array}{r}0\\+0\\\hline\end{array}$ $\begin{array}{r}4\\+0\\\hline\end{array}$

■ **Adding 1 is like counting by one. The sum of any number and 1 is the next higher number.**

■ **When zero (0) is added to another number, the sum is the other number.**

Place-Value Frame			
thousands	hundreds	tens	ones
/	////		/
///			
	//	////	////

Number-Reading Chart				
ten thousands	thousands	hundreds	tens	ones
8	0	2	4	0
	7	8	0	0
4	8	0	0	5

No Pencils, Please!

1. What number is shown on the first row of the place-value frame? On the second? On the third?

2. Think about this: You may use only 6 marks. You must put at least 1 mark in every place. What is the largest number that you can show on the place-value frame pictured above?

3. Does the number 183 mean one hundred eighty-three ones? Does it mean 18 tens and 3 ones? Does it mean 1 hundred, 8 tens, and 3 ones? Can 183 have any one of these three meanings?

4. Give as many meanings as you can for the number 584.

5. Read these numbers.

18,034   10,584   98,052   5,603

6. If you are not sure how to read a number, what will be a great help to you?

7. Read the first number on the number-reading chart at the top of the page. Why do you not say, "8 ten thousands"?

8. Is the second number on the chart the same as seven hundred eighty tens?

9. How is the last number on the chart read?

10. Which would you rather have, $8, $88, or $888? Why?

11. Name something that you think costs about $12,000.

12. Name something that costs about $12.

13. Is a new automobile worth about $275, or $2750?

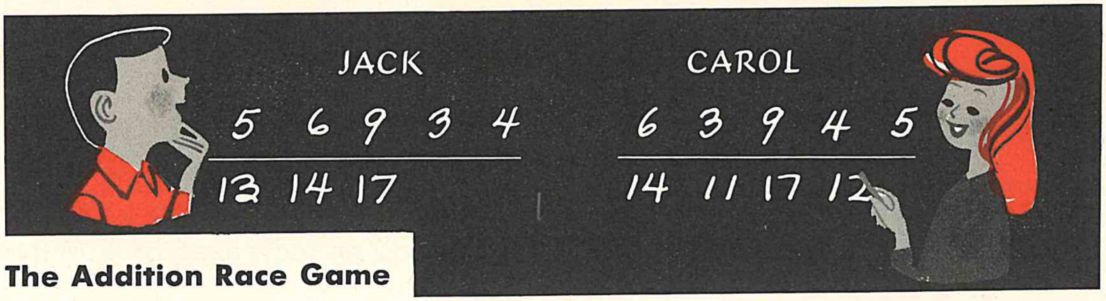
14. Is a new 5-room house worth about $15,000, or $1500?

15. Count by 100's to 2000. Begin with 100.

16. Tom counted, "50, 100, 150," and so on. By what number was he counting? Go on counting as Tom did. Stop when you reach 1000.

17. Count by 25's from 75 to 400.

18. Count by 100's from 1800 to 3000.



The Addition Race Game

1. Jack and Carol are playing an addition race game. They are adding the same number to each of the numbers above the line. What number are they adding?

2. Which child will probably win?

3. Bob and Ruth went to the board. They erased the sums that Jack and Carol wrote. Then Bob and Ruth added 9 to the numbers above the line. What sums did each write?

4. Draw the sets of numbers shown below. Work with a partner. Add 6 to each number in your set of numbers. Try to finish first. Try to have all sums correct.

5. Go on playing the addition race game. Add, using each of these numbers in turn: 4, 3, 8, 5, 7, and 9.

Set One

6	3	8	9	5
7	4	8	3	9

Set Two

9	8	3	5	6
4	7	9	3	8

Adding a Column of Numbers

1. Bill played bean bag. His scores were 6, 9, 4, 5, and 8. How do you think when you find his total score?

BILL
6
9
4
5
+8
32

Bill thought this way: "6 and 9 are 15. 15 and 4 are 19. 19 and 5 are 24. 24 and 8 are 32."

2. Jane added Bill's score like this: "6, 15, 19, 24, 32." Why is her way better than Bill's?

3. Add. Try to use Jane's way.

4	6	3	8	1	5	7
5	3	4	1	4	7	6
8	4	6	3	9	3	6
3	7	4	6	2	5	4
+6	+2	+5	+7	+6	+4	+8

Practice to Improve Column Addition

Write sums on folded paper.

1.	5	8	6	4
	3	7	2	5
	8	2	4	6
	6	9	5	7
	+4	+3	+8	+6

2.	9	7	5	2
	4	6	2	9
	5	7	3	4
	8	5	6	3
	+2	+6	+7	+5

When you add columns of numbers, you have to add two-figure numbers and one-figure numbers as, 16 and 6, 15 and 2. Do these additions. It will help you in column addition.

3.	27	34	16	23
	+2	+5	+3	+5
4.	13	45	62	35
	+5	+2	+3	+4
5.	24	22	18	35
	+8	+7	+6	+9
6.	12	54	43	24
	+7	+3	+7	+7

7. For each example in row 3 above make three addition facts. Have the facts alike in this way.

27	17	7	34	54	4
+2	+2	+2	+5	+5	+5
29	19	9	39	59	9

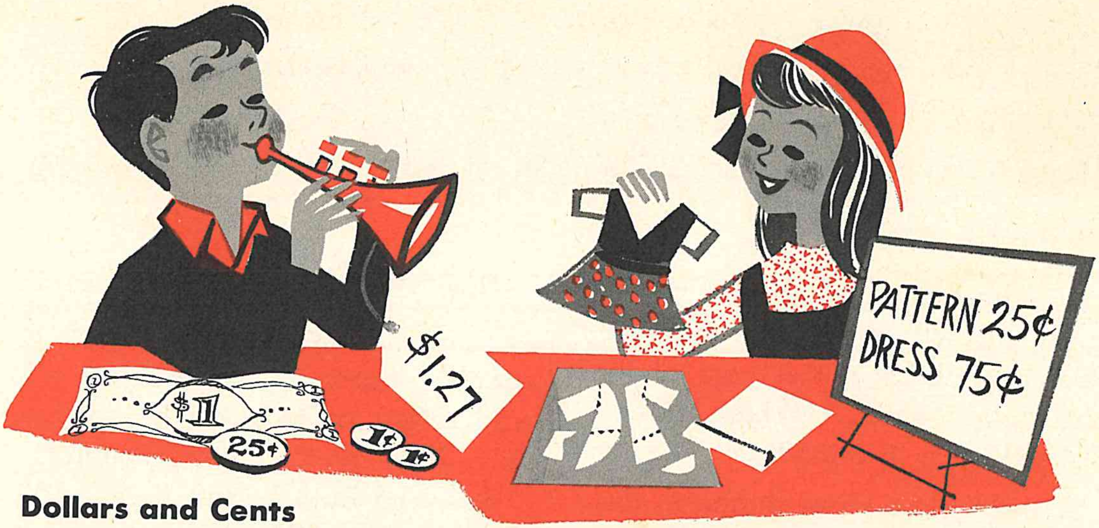
8. When you add 9 to a number ending in 6, the sum ends in 5. (9 and 6 = 15) The figure in tens place will be increased by 1. Why?

Add quickly.

9.	26	46	66	86
	+9	+9	+9	+9
10.	76	16	36	56
	+9	+9	+9	+9

Say these sums as fast as you can. Keep thinking of endings.

11. 46 and 3 — 65 and 4
12. 21 and 3 — 24 and 4
13. 27 and 3 — 28 and 3
14. 32 and 4 — 35 and 6
15. 26 and 5 — 45 and 5
16. 49 and 6 — 54 and 2
17. 63 and 4 — 74 and 7
18. 81 and 6 — 28 and 7
19. 29 and 2 — 27 and 8
20. 83 and 9 — 44 and 7
21. 35 and 5 — 36 and 8
22. 57 and 6 — 69 and 3
23. 66 and 5 — 68 and 4
24. 79 and 9 — 54 and 8
25. 78 and 5 — 58 and 7
26. 29 and 5 — 26 and 4
27. 86 and 9 — 83 and 8



Dollars and Cents

1. Jack wants to buy this horn. Has he put the right amount of money on the counter?

2. What part of the price tag shows dollars? What tells you that the 27 is cents, and not dollars?

3. Read the price on the doll dress. What tells you there are no dollars? How can you tell that the 75 means cents?

4. What must Jane pay for a pattern for a doll dress? How does the price card show that 25 means 25 cents?

Here are different ways to write cents.

Use the word cents, as 75 cents.

Use the cent sign, as 75¢.

Use the dollar sign and the cents point, as $.75.

When there are no dollars in the amount, 0 is sometimes written in dollars place, as $0.75.

If you use the dollar sign and cents point and write less than 10 cents, you must write 0 in dimes place, as $.08.

5. Read: $.05; $5.03; $0.79.

6. Read an amount of money from Column A. Then give the letter found before an equal amount in Column B.

COLUMN A	COLUMN B
$0.05	a. $0.18
Ten dimes	b. 25 cents
4 dollars and 1 cent	c. 5 dimes
2 dimes and 5 cents	d. $4.01
Fifty cents	e. $1.00
18¢	f. 5¢

Razor Blades - - - 49¢ a pkg.
Shaving Cream - - 36¢ a tube
Clothes Brushes - - 39¢ each
Shaving Lotion - 69¢ a bottle

Electric Razors - - - $15.00 each
Pen & Pencil Sets - $12.50 each
Bath Soap - - - - - - - 47¢ a box
Sure-Stay Wave Set - 95¢ a can

Talcum Powder - 45¢ a can
Writing Paper - - 98¢ a box
Greeting Cards - 97¢ a box
Perfume - - $9.00 an ounce

No Pencils, Please!

1. Ann saw these special prices in an advertisement. She thought, "Some of these things cost about one dollar each." Which things did she have in mind?

2. Jerry said three things in the special sale cost about 50¢ each. Which did he mean?

3. Two things in the sale cost close to 40¢ each. Which are they?

4. Ann has $1.00. She wants to buy a present for her father and one for her mother. How can you tell at a glance if she has enough money to buy a box of writing paper and razor blades?

5. With her $1.00, can Ann buy a clothes brush and a box of soap? Think: 39¢ is about 40¢, and 47¢ is about 50¢. Then you can answer easily.

6. Use a short way. Tell which present given below will cost less than $1.00.

A tube of shaving cream and a can of talcum powder.

A box of greeting cards and a clothes brush.

Now you will need your pencil.

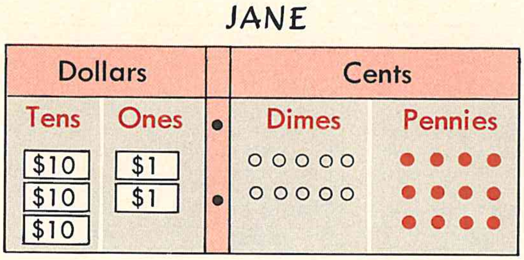
7. Mrs. Smith bought a box of greeting cards, a can of wave set, and a box of soap at the special sale. How much did she spend?

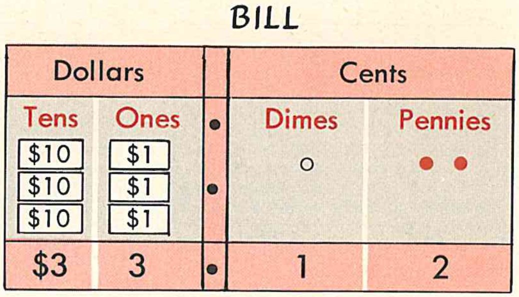
Sue and Ruth began their addition like this. Which do you think is the better way? Why?

SUE	97¢ 95¢ +47¢	RUTH	$.97 .95 +.47

8. Tell what each of the customers below bought at the special sale. Find how much each customer spent.

TOM	47¢ +45¢	ANN	$0.39 +0.36
SUE	$15.00 +12.50	JOE	$.98 +9.00
BILL	$9.00 +15.00	JIM	$12.50 +.45





Adding Larger Amounts of Money

1. Jane drew the picture above to show all the money her father had in his pocket and his billfold. Write this amount of money using the dollar sign and decimal point.

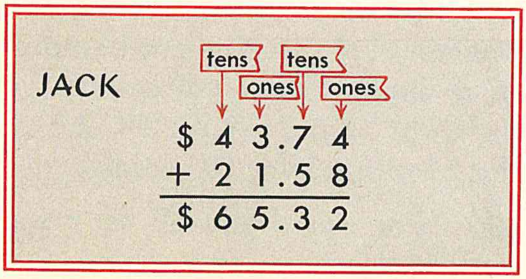
2. Then Bill drew his picture. He said it showed the same amount of money as Jane's. Was he right?

3. Jane's picture showed 12 pennies. Why does Bill's picture show only 2 pennies? Where did he show the other 10 pennies?

4. Bill showed 1 dime in his picture. How did he get his dime?

5. Bill's picture shows 1 dollar more than Jane's does. Where did this dollar come from?

6. Jack helps in the lunchroom. He had to add $43.74 and $21.58. When he added 4 cents and 8 cents, the sum was 12 cents, or ▯ ten and ▯ ones. What figure did he write in the sum? How did he find the 3 that he wrote next in his sum? Explain the rest of his addition.



▶ Copy, keeping the cents points in a straight column. Find sums.

7. $36.25+$17.86; $9.14+$1.05

8. $3.48+$4.85; $.09+$2.91

9. $4.85+$0.45+$1.12

▶ Copy. Find the sums.

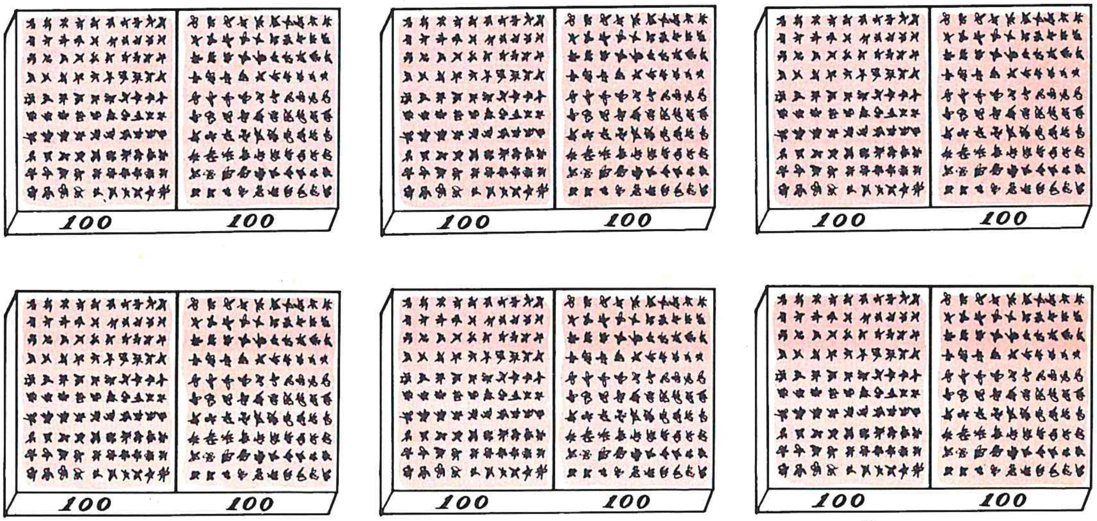
10.	37¢	65¢	43¢	25¢
	+24	+14	+52	+48

11.	$0.35	$0.63	$5.27
	+0.63	+0.28	+1.20

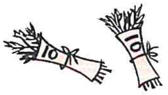
■ **Amounts of money like $0.35 and $0.63 may be written without the zero, as $.35 and $.65.**

▶ Copy. Find the sums.

12.	$2.75	$.79	$12.95
	.50	7.35	4.68
	+1.89	+.75	+.05



Using Ones, Tens, and Hundreds in Problems



1. Mr. Jones, a greenhouse owner, resets tomato plants in flats, or boxes. This makes the plants easy to count. In what way? Look at the picture above.

2. How many tomato plants are shown in all the flats? There are two ways of giving the answer. What are they?

3. A customer wants 50 plants. How many rows will be used?

4. Mrs. Smith wants 65 plants. How many rows and how many extra plants will be used?

5. Mr. Brown wants 425 plants. Mr. Jones said, "That will be 4 squares, 2 rows, and 5 plants." How did Mr. Jones figure this?

6. One day Mr. Jones sold 350 plants in the morning. In the afternoon he sold 580 plants. Count squares and rows and find how many plants he sold in all. Check the total by adding.

7. Which amount is larger, an order for one thousand one hundred twenty plants, or an order for eleven hundred sixty plants?

8. Mr. Jones filled an order for three hundred forty plants. How many tens would that be?

9. Mrs. Jones made small bundles of plants. She put 10 plants in a bundle. How will she fill an order for 12 plants? For 24 plants? For 36 plants? For 60 plants?

10. How would you fill an order for 288 plants?

Addition Review

I. Write sums on folded paper. Check by adding in the opposite direction.

1.	35 +41	26 +32	48 +21	59 +35	
2.	29 +36	44 +47	56 +29	83 +17	
3.	65 +27	48 +59	46 +39	79 +19	
4.	65 +54	83 +26	62 +95	57 +89	
5.	45 +78	37 +85	823 +548	617 +692	
6.	213 +465	241 +734	426 +259	255 +937	
7.	4 3 +2	6 1 +2	2 4 +6	3 5 +3	6 8 +9
8.	9 5 +7	16 42 +46	27 34 +48	415 244 +532	
9.	41 23 +14	25 13 +51	44 26 +29	23 28 +31	
10.	431 234 +203	243 315 +220	208 372 +113	352 415 +729	
11.	135 +583	473 +251	268 +480	354 +775	

II. Copy. Find the sums. Check your addition by using the mark-out check.

1.	475 +259	189 +564	265 +379	394 +427
2.	32 58 +46	25 49 +54	72 26 +37	34 68 +54
3.	53 43 +86	82 37 +97	76 98 +67	84 75 +28
4.	76 56 32 +71	28 49 24 +58	35 44 78 +22	97 33 36 +15
5.	243 156 +273	563 275 +157	837 329 +384	473 256 +798
6.	415 15 38 +240	227 4 76 +193	786 383 8 +34	18 2 36 +971

III. Copy neatly in straight columns. Find the sums.

1. 2+6+4+9+5
2. 25+46+78+56
3. 115+7+38+246
4. 47+245+8+43
5. 45¢+5¢+15¢+32¢
6. $.59+$4.98+$.05

How Well Have You Learned?

Would you like to know how well you have learned the work of this unit? You can find out by doing these exercises.

1. Draw a place-value frame. On it show the number 280. (2)

2. Make an abacus drawing. Show the number that is equal to four hundreds and five ones. (2, 3)

3. Make a number-reading chart. Show how the number 16091 can be read. (2, 4)

4. Use words. Write the number 53,604. (4)

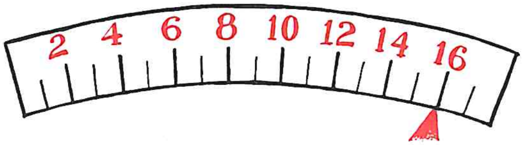
5. Add 7+9+3+8+7. Check your sum by using the mark-out check. (6)

6. Use a dot drawing. Show that the sum of 7 and 5 is 12. (8)

7. Use a number line. Find the sum of 7 and 4. (8)

8. Make an exercise for the game Follow Me. Be sure that you are able to do the exercise you make up. (9)

9. The front of a certain basic fact card says, "15 ." Write the basic addition questions that are on the back of this card. (10)



10. Use the dollar sign and figures. Write two dollars and six cents. (21)

11. Add 43 and 26 using the words "tens" and "ones." (13)

12. Make two sets of numbers that could be used in an addition race like Jack's and Carol's. (19)

13. Make four addition facts with endings that use the fact 6+5=11. (20)

14. Add 361, 225, and 313 using the words "hundreds," "tens," and "ones." (15)

15. Study the following additions.

JOE	MARY	TED
384 232 +196 812	634 +283 917	236 329 +418 983

In whose addition are 2 tens carried to tens column? In whose addition is there a hundred carried to hundreds column? (13, 15)

16. How many times must you carry in adding 278 and 495? (16)

Helping Yourself

Do all the problems on this page. Then find out which answers you did not get right.

The numbers in color show pages that will help you where you made mistakes.

1. Alice read 2 books. One of the books had 278 pages in it. The other had 324 pages. How many pages did she read in all? (15)

2. One book has 224 pages. Another book has 192 pages. A third has 310 pages. How many pages are there in the 3 books? (15)

3. There are 428 boys in Ann's school and 494 girls. How many children go to her school? (16)

4. Sue's mother paid $7.95 for a hat, $1.25 for a scarf, and $.50 for some ribbon. How much did her mother spend? (23)

5. Joan said she paid two dollars for a pair of gloves. She also paid five dollars and five cents for a pair of shoes and thirty-nine cents for a handkerchief. How much did she spend in all? (23)

Use folded paper. Find the sums.

6. $\begin{array}{r} 49 \\ +8 \\ \hline \end{array}$ $\begin{array}{r} 98 \\ +6 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ +7 \\ \hline \end{array}$ $\begin{array}{r} 28 \\ +4 \\ \hline \end{array}$ (20)

7. $\begin{array}{r} 33 \\ +20 \\ \hline \end{array}$ $\begin{array}{r} 13 \\ +54 \\ \hline \end{array}$ $\begin{array}{r} 43 \\ +33 \\ \hline \end{array}$ $\begin{array}{r} 65 \\ +24 \\ \hline \end{array}$ (12)

8. $\begin{array}{r} 29 \\ +45 \\ \hline \end{array}$ $\begin{array}{r} 58 \\ +36 \\ \hline \end{array}$ $\begin{array}{r} 27 \\ +48 \\ \hline \end{array}$ $\begin{array}{r} 18 \\ +29 \\ \hline \end{array}$ (13)

9. $\begin{array}{r} 54 \\ +63 \\ \hline \end{array}$ $\begin{array}{r} 81 \\ +36 \\ \hline \end{array}$ $\begin{array}{r} 45 \\ +84 \\ \hline \end{array}$ $\begin{array}{r} 74 \\ +71 \\ \hline \end{array}$ (13)

10. $\begin{array}{r} 583 \\ +156 \\ \hline \end{array}$ $\begin{array}{r} 249 \\ +490 \\ \hline \end{array}$ $\begin{array}{r} 767 \\ +651 \\ \hline \end{array}$ (15)

11. $\begin{array}{r} 465 \\ 204 \\ +378 \\ \hline \end{array}$ $\begin{array}{r} 375 \\ 137 \\ +439 \\ \hline \end{array}$ $\begin{array}{r} 185 \\ 532 \\ +266 \\ \hline \end{array}$ (16)

12. Ruth often gets her answers wrong. Why?

JANE $\begin{array}{r} 6 \\ 3 \\ 5 \\ +7 \\ \hline 21 \end{array}$ $\begin{array}{r} \$12.05 \\ .37 \\ +1.65 \\ \hline \$14.07 \end{array}$

RUTH $\begin{array}{r} 6 \\ 3 \\ 5 \\ +7 \\ \hline \end{array}$ $\begin{array}{r} \$12.05 \\ .37 \\ +1.65 \\ \hline \end{array}$

Copy neatly in straight columns. Add. Use the mark-out check.

13. 3, 6, 5, 6; 7, 5, 8, 4, 2 (6)

14. 24, 13, 41; 35, 71, 54 (6)

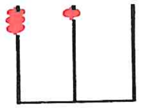
15. $5.95, $.79, $.04, $18.75 (23)

How Well Are You Doing?

Answer these questions. It will help you find out how well you have learned some of the important things in Unit One.

1. How many marks do you need to show 275 on a place-value frame?

2. What number is shown on this abacus drawing?



3. How many zeros do you use to write the number eighty thousand twelve?

4. Suppose you were not sure how to read the number 70200. What help would you use?

5. Suppose you used the mark-out check for this example:

$$16+30+29=75$$

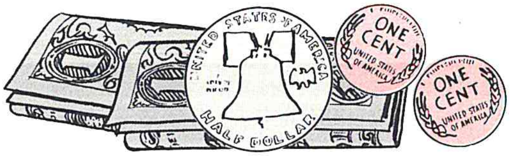
What numbers would you mark out?

6. Can a dot drawing be used to show an addition fact? Use the fact 5+6=11 in answering.

7. How are these additions alike?

8	28	68	48
+7	+7	+7	+7

8. What amount of money is pictured below?



9. A basic sum card has a large 16 and a small 3 on one side. Write the addition questions that are on the other side.

10. Write the number five thousand four. What figure is in tens place?

11. Can a number line be used to add two-figure numbers? Use 22 and 19 in answering.

Find the sums. Use mark-out check.

12.

38	27	56	49
45	38	27	32
50	48	92	20
+28	+57	+98	+18

13.

536	254	293	817
282	348	160	458
+193	+691	+490	+237

14.

$ .15	$ 2.27	$6.73
9.27	14.50	2.51
1.25	3.95	.07
.70	.20	.59
+5.50	+21.46	+1.62

Playing Winner Stands

In this game the teacher asks a number question. Only the child standing and the child seated in the nearby desk may answer. The first to answer is the winner. The winner stands beside the pupil in the next desk, and the game goes on.

Frank, the boy standing, was first to answer these questions: How much is 3 from 11? 6 from 15? 10 from 30? 13 take away 4?

Can you answer the subtraction questions that Frank answered? Play the game Winner Stands.

Here are some number questions to use for the game or for practice.

1. How much is 6 from 9?

2. How much is 8 from 14?

3. Thirteen take away 9 is how much?

4. Sixteen is how many more than 8?

5. What is the difference between 9 and 15?

6. Write other subtraction questions. Use them in the game Winner Stands.

Here are short ways to write subtraction questions.

$$12 - 9 = \boxed{?} \qquad \begin{array}{r} 12 \\ -9 \\ \hline \boxed{?} \end{array}$$

These subtraction questions are read, "Nine from 12 is how many?"

■ **The sign — is called the minus sign.**

■ **A subtraction question together with its answer is called a subtraction fact.**

7. Read these subtraction facts.

$$\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array} \quad \begin{array}{r} 10 \\ -5 \\ \hline 5 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array} \quad \begin{array}{r} 2 \\ -1 \\ \hline 1 \end{array} \quad \begin{array}{r} 7 \\ -5 \\ \hline 2 \end{array} \quad \begin{array}{r} 3 \\ -2 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 11 \\ -5 \\ \hline \end{array}$$

1. How many are left?
2. How many more?
3. What is the other part?
4. How many are gone?
5. How much greater?
6. How much smaller?
7. How much less?
8. What is the difference?

When Do You Use Subtraction?

The teacher said, "We used subtraction in playing Winner Stands. At what other times do we use subtraction?"

The children said subtraction is used to answer questions asked in problems. They put subtraction problem questions on the board.

1. Read the eight questions.

2. Use 11 − 5, and show how some of the eight questions might be used in a problem.

Tom gave this problem for the first question: I had 11 pencils. I gave Ann 5 of them. How many pencils did I have left?

3. Find another question on the bulletin board that might be asked in Tom's problem.

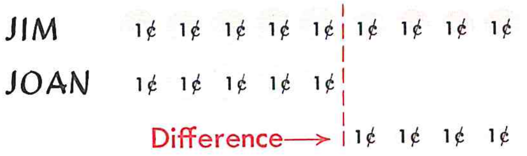
4. Which subtraction questions can you ask for the following problem?

Jack checked his 12 fishing lines. He found that the bait was gone from some of the hooks. Seven hooks still had bait on them. How many hooks needed bait?

5. You can use more than one question for the next problem. Which questions are they?

Bob has 16 marbles. Bill has 9 marbles. How many marbles does Bill need in order to have as many marbles as Bob?

Jim and Joan had some pennies. They wanted to compare the amounts they had. They drew this picture.



Use the picture above and answer these questions.

6. Jim has how many more pennies than Joan?

7. Jim's amount of money is how much greater than Joan's?

8. Joan's amount of money is how much less than Jim's?

9. What is the difference between the two amounts of money?

Making Subtraction Problems

Make each of the following into a problem by asking a subtraction problem question.

1. Bob's dart game score was 15. Dave's score was 9.

2. Jack had 12 eggs. He found that 7 of them were broken.

3. When the party began, there were 17 children. Now there are only 8 children left at the party.

4. Bill lost 3 of the 10 arrows that belonged in his archery set.

5. Mary put 14 cookies on a plate. Later there were only 5 cookies on the plate.

6. Five of the 15 rose bushes planted in the school yard died.

7. Ann has 8 coupons. She needs 15 in all to get a prize.

8. A wire 13 ft. long was cut into two pieces. One piece is 8 feet long.

In one class these questions were suggested for problem 8.

a. What is the difference between the lengths of the two pieces?

b. What is the length of the two pieces?

c. How much longer is the other piece?

d. How long is the other piece?

e. How much of the wire was gone?

f. How much of the wire is left?

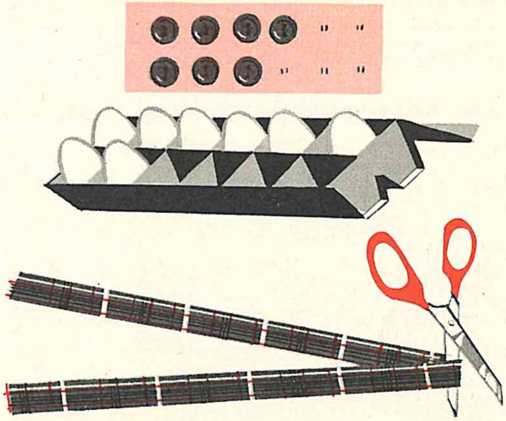
Which of the questions is best?

9. Jim had 12 airplane pictures. He decided to keep the 8 that he liked best. How many could he give away?

10. Ann had a card of 12 buttons. When she got ready to use the buttons, she found only 7 buttons on the card. How many were gone?

11. Bill has a box that holds 12 eggs. There are 8 eggs in the box. How many more will it hold?

12. Mary had a piece of ribbon that is 18 inches long. She cut it into two parts. One part is 9 inches long. How long is the other part?



Do You Know the Basic Subtraction Facts Well?

For each row, cover the answers with folded paper. Write the answers. Then move your paper. Were your answers correct?

1.	$\begin{array}{r}14\\-6\\\hline 8\end{array}$	$\begin{array}{r}10\\-7\\\hline 3\end{array}$	$\begin{array}{r}13\\-8\\\hline 5\end{array}$	$\begin{array}{r}17\\-9\\\hline 8\end{array}$
2.	$\begin{array}{r}12\\-7\\\hline 5\end{array}$	$\begin{array}{r}10\\-2\\\hline 8\end{array}$	$\begin{array}{r}14\\-9\\\hline 5\end{array}$	$\begin{array}{r}10\\-3\\\hline 7\end{array}$
3.	$\begin{array}{r}17\\-8\\\hline 9\end{array}$	$\begin{array}{r}11\\-3\\\hline 8\end{array}$	$\begin{array}{r}13\\-6\\\hline 7\end{array}$	$\begin{array}{r}15\\-6\\\hline 9\end{array}$
4.	$\begin{array}{r}13\\-5\\\hline 8\end{array}$	$\begin{array}{r}16\\-7\\\hline 9\end{array}$	$\begin{array}{r}13\\-9\\\hline 4\end{array}$	$\begin{array}{r}11\\-7\\\hline 4\end{array}$
5.	$\begin{array}{r}12\\-5\\\hline 7\end{array}$	$\begin{array}{r}11\\-9\\\hline 2\end{array}$	$\begin{array}{r}10\\-4\\\hline 6\end{array}$	$\begin{array}{r}14\\-7\\\hline 7\end{array}$
6.	$\begin{array}{r}15\\-7\\\hline 8\end{array}$	$\begin{array}{r}12\\-8\\\hline 4\end{array}$	$\begin{array}{r}18\\-9\\\hline 9\end{array}$	$\begin{array}{r}16\\-9\\\hline 7\end{array}$
7.	$\begin{array}{r}10\\-9\\\hline 1\end{array}$	$\begin{array}{r}13\\-7\\\hline 6\end{array}$	$\begin{array}{r}16\\-8\\\hline 8\end{array}$	$\begin{array}{r}15\\-6\\\hline 9\end{array}$
8.	$\begin{array}{r}15\\-8\\\hline 7\end{array}$	$\begin{array}{r}12\\-9\\\hline 3\end{array}$	$\begin{array}{r}11\\-8\\\hline 3\end{array}$	$\begin{array}{r}14\\-8\\\hline 6\end{array}$

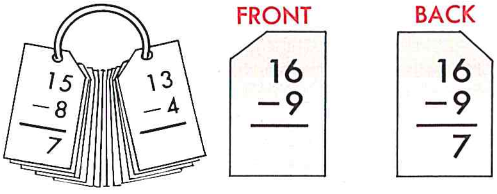
Here are some ways to learn basic subtraction facts. Can you think of other good ways?

How to Study Subtraction Facts

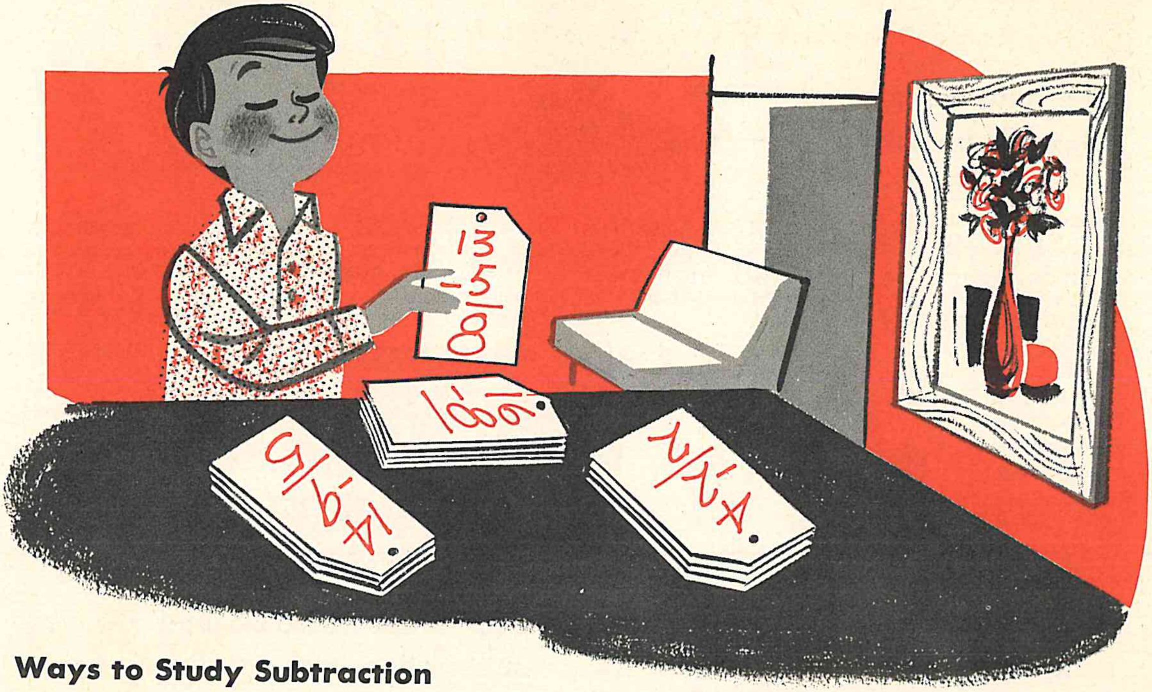
- Read the fact carefully. For $\begin{array}{r}12\\-9\\\hline 3\end{array}$ say, "Nine from 12. Three."
- Close your eyes. Think the fact. Say it.
- Look at the fact. Is it as you thought? If not, do all the steps again.

- Make a set of basic fact cards for subtraction. Page 323 gives all the basic subtraction facts.
- Put your basic fact cards on a notebook ring. See how fast you can go around the ring giving the right answers.

Basic Subtraction Fact Card



Why do you think the subtraction facts on page 323 are called "basic" facts?



Ways to Study Subtraction

1. What numbers are on the other side of the card that Bob has in his hand?

2. Why does Bob have three stacks of cards on the table? If you are not sure of your answer, page 10 will help you.

Bob said he studied subtraction facts by saying them again and again. Many pupils like to study that way.

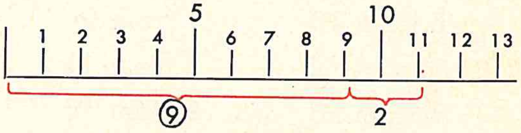
3. Turn to page 323. Say again and again any of the facts on that page that you are not sure you know.

Dot drawings help some pupils to learn the facts. The dot drawing here shows 6 − 4 = 2.

1 2 3 4 5 6
● ● ✗ ✗ ✗ ✗

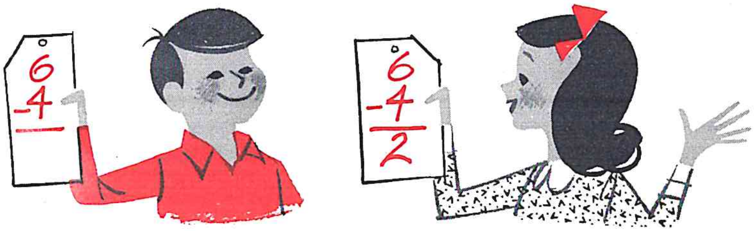
4. Make dot drawings for 8 − 3 = 5; 12 − 8 = 4; and 11 − 2 = 9.

The number line also helps some people to learn facts. The subtraction fact 11 − 2 = 9 is shown here on the number line.



5. Show 15 − 7 = 8; 12 − 5 = 7; 13 − 9 = 4 on number lines.

Learning More About Subtraction



Write answers on folded paper. Circle answers you did not remember quickly.

1.	10 −6	14 −5	13 −6	16 −7	13 −9
2.	15 −8	12 −8	11 −2	17 −9	15 −6
3.	11 −5	11 −9	13 −4	18 −9	14 −7
4.	10 −7	13 −8	17 −8	12 −6	11 −8
5.	15 −9	16 −8	12 −4	16 −9	14 −6
6.	10 −4	12 −9	14 −8	12 −3	13 −7

7. Use dot drawings. Show the facts you did not know very well. Write the facts. Study them. Use the ways given on page 32.

8. Play Winner Stands. Begin with these subtraction questions.

6 from 16
6 from 12
7 from 13
7 from 9
2 from 11
9 from 17

9. Play a subtraction race game as you did the addition race game on page 19. Play with a partner. Begin by subtracting 6 from each number in the sets below. Then subtract other one-figure numbers.

12 9 13 16 14   13 16 14 12 9

10 11 15 18 17   15 11 18 10 17

10. Work with a partner. Use your subtraction fact cards. Study all subtraction facts.

Easy Riddles

1. I am 9 less than 15. What number am I?

2. The difference between me and 17 is 8. What number am I?

3. If you take me from 14, you will have 9 left. What number am I?

4. One part of Joe's 13 pennies is 4 pennies. I am the other part. How many pennies am I?

5. One part of 15 is 6. I am the other part. What number am I?

6. If you take me from 16, you have 7 left. What number am I?

No Pencils, Please!

1. Dan left home 5 minutes after 8. He got to school at 23 minutes after 8. How many minutes did it take him to get to school?

2. A pencil was 7 inches long when it was new. Now it is only 4 inches long. How much of the pencil has been used?

3. A kite has a tail 14 inches long. How many inches must be added to the tail to make it 22 inches long?

4. Jack had 15¢. He spent 6¢ for some kite string. How much money did he have left?

5. Jane's doll is 15 inches tall. Mary's doll is 9 inches tall. Mary's doll is how much shorter than Jane's?

6. Joe wants a board that is 9 inches wide. He has a board that is 12 inches wide. How many inches will have to be cut off the width to make the board that Joe wants?

7. Jane planted 16 plants. Nine of them died. How many lived?

Watch signs. Give answers.

8. $9-4=$ ⍰ $\quad 18-9=$ ⍰

9. $17-8=$ ⍰ $\quad 8+6=$ ⍰

10. $7+9=$ ⍰ $\quad 15-7=$ ⍰

11. The number one hundred fifty is equal to how many tens?

12. The number 158 is equal to ⍰ hundreds, ⍰ tens, and 8 ones, or ⍰ tens and ⍰ ones, or ⍰ ones.

13. What number is three hundred sixty-seven ones?

▶ Use folded paper. Write answers.

14. $\begin{array}{r}11\\-8\\\hline\end{array}\quad\begin{array}{r}18\\-9\\\hline\end{array}\quad\begin{array}{r}13\\-7\\\hline\end{array}\quad\begin{array}{r}16\\-8\\\hline\end{array}\quad\begin{array}{r}17\\-8\\\hline\end{array}$

15. $\begin{array}{r}13\\-4\\\hline\end{array}\quad\begin{array}{r}15\\-9\\\hline\end{array}\quad\begin{array}{r}11\\-6\\\hline\end{array}\quad\begin{array}{r}13\\-9\\\hline\end{array}\quad\begin{array}{r}14\\-9\\\hline\end{array}$

16. $\begin{array}{r}15\\-6\\\hline\end{array}\quad\begin{array}{r}14\\-8\\\hline\end{array}\quad\begin{array}{r}13\\-5\\\hline\end{array}\quad\begin{array}{r}16\\-7\\\hline\end{array}\quad\begin{array}{r}14\\-5\\\hline\end{array}$

17. $\begin{array}{r}13\\-6\\\hline\end{array}\quad\begin{array}{r}17\\-9\\\hline\end{array}\quad\begin{array}{r}11\\-9\\\hline\end{array}\quad\begin{array}{r}16\\-9\\\hline\end{array}\quad\begin{array}{r}15\\-7\\\hline\end{array}$

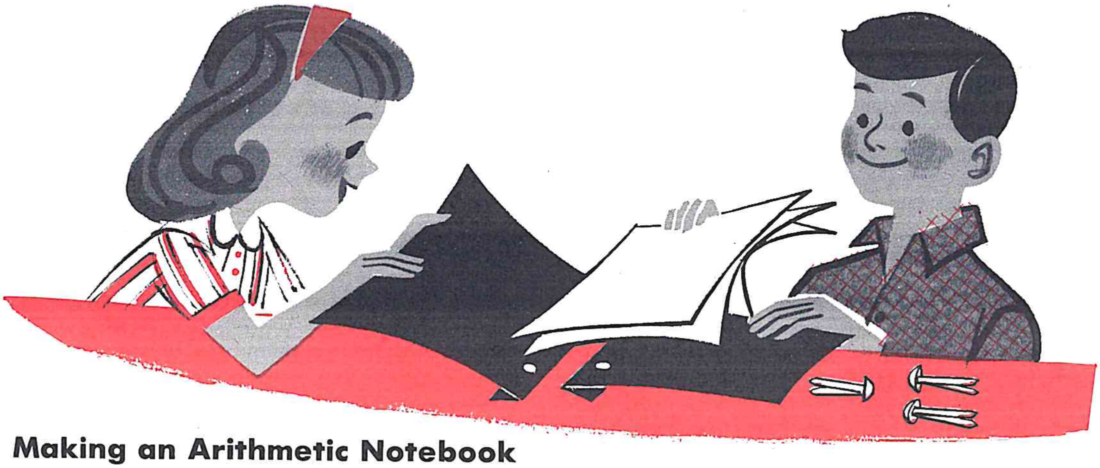
18. $\begin{array}{r}13\\-8\\\hline\end{array}\quad\begin{array}{r}11\\-2\\\hline\end{array}\quad\begin{array}{r}14\\-6\\\hline\end{array}\quad\begin{array}{r}12\\-9\\\hline\end{array}\quad\begin{array}{r}12\\-8\\\hline\end{array}$

19. $\begin{array}{r}14\\-7\\\hline\end{array}\quad\begin{array}{r}12\\-4\\\hline\end{array}\quad\begin{array}{r}15\\-8\\\hline\end{array}\quad\begin{array}{r}12\\-5\\\hline\end{array}\quad\begin{array}{r}11\\-3\\\hline\end{array}$

20. Use dot drawings. Show that your answers for row 14 are correct.

21. Use number lines. Show that your answers for row 18 are correct.

22. If you could not think of the answer to a basic subtraction question, what would you do?



Making an Arithmetic Notebook

An arithmetic notebook will help you in many ways. You can write, draw, or paste important things in it. If you do not have such a notebook already, here is an easy way to make one.

Use two sheets of heavy paper for covers. Begin with about ten sheets of paper for the pages. Use the paper that you use regularly in working your arithmetic. Cut the cover paper to fit the pages.

Get three paper fasteners to hold your notebook together. You can add more pages as you need them.

Take good care of your notebook. Keep your eyes wide open for good helps to put in it.

1. On page 1 of your notebook, write the addresses of ten of your school friends. If they have telephones, write their telephone numbers, too. Find a partner. Read what you have written aloud to your partner. Did you write each figure well?

2. For your second page, ask your teacher for the writing sample of figures that you wrote for page 4. Write another sample of your best figures. How does this sample compare with the figures you wrote for page 4? Are you doing better?

3. For another page in your notebook put your Improvement Test 1, (page 17).

Use folded paper. Write the answers for rows 1 through 8 on page 17 again. Check your answers.

Does your work show that you have improved? Did you find that you now add faster?

Subtracting Two-Figure Numbers

Mary's class planted 48 tulip bulbs. One day in spring the class found 20 tulip plants were up. Mary said, "There are still 28 more to come up." The teacher asked Mary how she knew.

Mary said, "20 is two 10's. 48 − 10 is 38. Then take 10 from 38. That leaves 28."

1. Use a number line. Show that Mary's thinking was correct.

Find the answers to these subtractions. Use Mary's way of thinking.

2.	37 − 20	70 − 30	72 − 20
3.	68 − 40	96 − 20	76 − 30
4.	85 − 20	63 − 20	47 − 30
5.	51 − 30	45 − 20	53 − 40

6. Use a number line like the one at the bottom of this page. Show that your answers to the last four subtractions above are correct.

7. Be sure you practice the basic subtraction facts often.

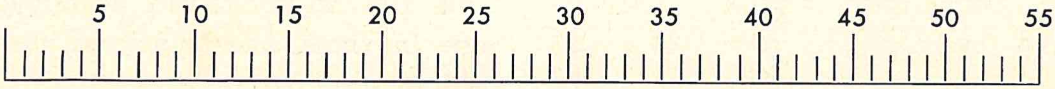
▶ Write answers on folded paper.

8.	12	9	13	14	10
	−9	−5	−9	−8	−5
9.	9	11	13	11	11
	−3	−4	−8	−9	−5
10.	5	15	12	10	10
	−3	−8	−4	−7	−4
11.	10	12	7	7	8
	−8	−6	−2	−4	−5
12.	9	8	12	18	14
	−2	−4	−7	−9	−7
13.	14	8	6	6	13
	−9	−2	−3	−2	− 6
14.	15	16	4	17	11
	−9	−8	−2	−9	−8

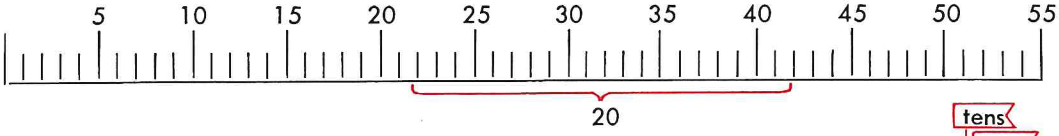
15. Why are the facts written in color above often called "doubles"?

16. For each fact in rows 8-14, write a related subtraction fact, as has been done here.

12	12	9	9	13	13
−9	−3	−5	−4	−9	−4
3	9	4	5	4	9



ALICE



DAN

4 tens 2 ones
−2 tens 0 ones
2 tens 2 ones = 22

BETTY

42 − 10 = 32
32 − 10 = 22

42 − 20 = 22

CARL

tens
ones

$$\begin{array}{r} 42 \\ -20 \\ \hline 22 \end{array}$$

A Short Way of Subtracting Two-Figure Numbers

1. Which child used the shortest way to find the answer to 42 − 20?

2. Explain how Betty subtracted.

3. Explain how Dan subtracted.

Carl used figures. He subtracted the ones first: Zero from 2 = 2. Then he subtracted the tens: 2 tens from 4 tens = 2 tens.

▶ Use Carl's way. Write answers on folded paper.

4.	76 − 20	35 − 20	38 − 10	66 − 40	35 − 22
5.	78 − 34	56 − 21	74 − 52	84 − 60	69 − 43
6.	65 − 43	48 − 24	79 − 57	58 − 15	44 − 33
7.	69 − 27	75 − 25	98 − 62	50 − 20	68 − 38
8.	93 − 53	39 − 18	57 − 24	36 − 12	58 − 35
9.	54 − 30	38 − 14	67 − 25	64 − 42	45 − 13

10. Use a number line. Check your answers to the examples in row 9.

11. In a basketball game, the first team had a score of 24 points. The second team had a score of 35 points. The second team was how many points ahead of the first team?

12. There were 79 children watching the game. Of these, 52 were boys. How many were girls?

13. There were 98 seats around the basketball court. If 79 children were seated, how many empty seats were there?

14. At the end of the game, the first team had 40 points. The second team had 52 points. By how many points did the second team win?

15. The number one hundred and fifty equals how many tens?

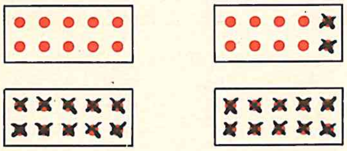
16. How many marks would you use to show one thousand on a place-value frame?

More About Subtracting Two-Figure Numbers

1. Bill had 40 pages in his notebook. He had used 22 pages. How many pages were not used?

Bill thought, "10 from 40 is 30; 10 from 30 is 20; 2 from 20 is 18." To check his subtraction, he counted the pages that were not used. Was Bill's answer correct?

2. Ann used another check. She drew four cards, each with 10 dots. Then she crossed out 22 dots. How many were left?



Use Bill's way to find the answers to these subtractions. Make a dot drawing and check four of your subtractions.

3. $60-17$ $\quad 90-14$ $\quad 40-18$

4. $50-23$ $\quad 60-25$ $\quad 70-36$

Sally tried to subtract $60-37$ using Bill's way. She found she did not know how. She thought it took too long to make a dot drawing. She subtracted this way.

SALLY $60-30=30$
$30-\ 7=23$
$60-37=23$

Use Sally's way to find the answers to these subtractions.

5. $90-52$ $\quad 50-38$ $\quad 60-27$

Joe showed Bill and Sally the short way to subtract 37 from 60. You no doubt know this way, too.

Joe said, "You cannot subtract 7 from 0. You must change one of the 6 tens in 60 to 10 ones. That leaves only 5 tens in tens place. Now you can subtract."

$$\text{A. }\begin{array}{r} 60 \\ -37 \\ \hline \end{array} \qquad \text{B. }\begin{array}{r} \overset{5}{\cancel{6}}\,{}^{1}0 \\ -3\ 7 \\ \hline \end{array} \qquad \text{C. }\begin{array}{r} \overset{5}{\cancel{6}}\,{}^{1}0 \\ -3\ 7 \\ \hline 2\ 3 \end{array}$$

Subtract the ones first. Then subtract the tens. Read the difference.

Find the answers the short way.

$$6.\quad \begin{array}{r} 70 \\ -28 \\ \hline \end{array} \quad \begin{array}{r} 30 \\ -18 \\ \hline \end{array} \quad \begin{array}{r} 60 \\ -34 \\ \hline \end{array} \quad \begin{array}{r} 70 \\ -46 \\ \hline \end{array} \quad \begin{array}{r} 50 \\ -27 \\ \hline \end{array}$$

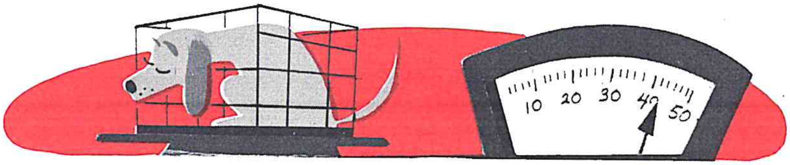
$$7.\quad \begin{array}{r} 40 \\ -24 \\ \hline \end{array} \quad \begin{array}{r} 90 \\ -58 \\ \hline \end{array} \quad \begin{array}{r} 50 \\ -19 \\ \hline \end{array} \quad \begin{array}{r} 80 \\ -62 \\ \hline \end{array} \quad \begin{array}{r} 90 \\ -65 \\ \hline \end{array}$$

$$8.\quad \begin{array}{r} 30 \\ -12 \\ \hline \end{array} \quad \begin{array}{r} 40 \\ -17 \\ \hline \end{array} \quad \begin{array}{r} 70 \\ -31 \\ \hline \end{array} \quad \begin{array}{r} 90 \\ -46 \\ \hline \end{array} \quad \begin{array}{r} 60 \\ -27 \\ \hline \end{array}$$

9. Check your answers to row 7. Use Bill's way of subtracting.

10. Check your answers to row 6. Use Sally's way of subtracting.

Using Subtraction to Solve a Problem



1. Jack's dog would not stand on the scale to be weighed. Jack got an empty crate. He weighed it. It weighed 17 pounds. Then he put the dog into the crate. Look at the picture above. Find how much the dog weighs.

Use a number line if you are not sure that you subtracted right.

2. Jack subtracted 17 from 41. He said he would have to change a ten to ones. Look at his subtraction. What did he think as he subtracted?

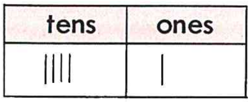
JACK

$$\begin{array}{r} \overset{3}{\cancel{4}}\,{}^{1}1 \\ -1\;7 \\ \hline 2\;4 \end{array}$$

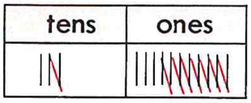
3. Nancy checked Jack's work. She used the place-value frame. Study pictures A, B, and C below. Explain what Nancy did to find her answer.

NANCY

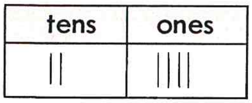
A.



B.



C.



🟥 **Changing a ten to ones in subtraction is called borrowing. A ten from tens place is borrowed. The ten is changed to ones and the ten ones are put in ones place.**

▶ Find answers. Borrow as Jack did.

4.	92 −25	52 −38	68 −19	32 −15	46 −17
5.	65 −16	71 −43	84 −55	61 −42	76 −29
6.	76 −37	54 −28	82 −56	47 −18	35 −19

7. Check the first three of your answers. Use Sally's way of subtracting.

8. Check the last three of your answers. Use the way that Jerry used here.

JERRY

$$\begin{array}{rl} 41 = & 3 \text{ tens } 11 \text{ ones} \\ -17 = & -1 \text{ tens } \;\; 7 \text{ ones} \\ \hline & 2 \text{ tens } \;\; 4 \text{ ones} = 24 \end{array}$$

9. Play Follow Me. Begin with this exercise.

7 + 8 − 5 − 1 + 10 − 8 − 6 + 12 + 3 + 8 − 4 + 6 − 2 − 9 = ▨

BETTY

Subtraction Basic Fact Family

$$\begin{array}{rrrrrrrrr} 9 & 19 & 29 & 39 & 49 & 59 & 69 & 79 & 89 \\ -5 & -5 & -5 & -5 & -5 & -5 & -5 & -5 & -5 \\ \hline 4 & 4 & 4 & 4 & 4 & 4 & 4 & 4 & 4 \end{array}$$

Subtracting One-Figure Numbers from Two-Figure Numbers

1. When Nancy played Follow Me, she always got lost. She could not subtract such numbers as 5 from 39. Betty wrote something on the board to help Nancy. Can you explain this help?

Subtraction questions can be put into basic fact families.

■ **In a basic fact subtraction family, all of the subtraction questions end with the same basic subtraction fact.**

2. Write three other subtraction questions that belong in each of these families.

$$\begin{array}{rrr} 25 & 5 & 15 \\ -3 & -3 & -3 \\ \hline 22 & 2 & 12 \end{array} \qquad \begin{array}{rrr} 58 & 48 & 8 \\ -2 & -2 & -2 \\ \hline 56 & 46 & 6 \end{array}$$

$$\begin{array}{rrr} 77 & 57 & 17 \\ -8 & -8 & -8 \\ \hline 69 & 49 & 9 \end{array} \qquad \begin{array}{rrr} 31 & 11 & 61 \\ -4 & -4 & -4 \\ \hline 27 & 7 & 57 \end{array}$$

▶ Think of basic subtraction facts as you find the answers.

3. $\begin{array}{rrrrr} 46 & 66 & 26 & 86 & 56 \\ -5 & -5 & -5 & -5 & -5 \\ \hline \end{array}$

4. $\begin{array}{rrrrr} 33 & 53 & 73 & 93 & 43 \\ -3 & -3 & -3 & -3 & -3 \\ \hline \end{array}$

5. $\begin{array}{rrrrr} 64 & 54 & 84 & 74 & 24 \\ -7 & -7 & -7 & -7 & -7 \\ \hline \end{array}$

6. $\begin{array}{rrrrr} 25 & 45 & 65 & 95 & 75 \\ -8 & -8 & -8 & -8 & -8 \\ \hline \end{array}$

7. $\begin{array}{rrrrr} 65 & 47 & 54 & 38 & 48 \\ -3 & -7 & -9 & -4 & -6 \\ \hline \end{array}$

8. $\begin{array}{rrrrr} 36 & 83 & 94 & 35 & 41 \\ -5 & -3 & -7 & -8 & -6 \\ \hline \end{array}$

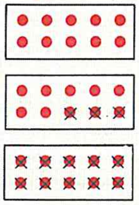
9. Which subtractions in row 8 were most difficult? Why?

10. How is taking 8 from 25 or 8 from 45 like taking 8 from 15?

11. The ones part of the answer for the questions in row 5 is what number?

12. There are addition basic fact families, too. On page 20 you learned about them, but you did not use this name. Study page 20 now if you are getting lost in the Follow Me game.

Longest Way



A Long Way

$30 - 13 = \square$

$30 - 10 = 20$

$20 - \ \ 3 = 17$

$30 - 13 = 17$

A Shorter Way

$30 - 10 - 3 = 17$

Shortest Way

THINK: 30, 20, 17

Ways of Subtracting

The class showed four ways to subtract 13 from 30. Look at each way carefully.

1. In the shortest way, you just think, "Thirty, twenty," and then you answer, "seventeen." How is twenty found? How is seventeen found?

Use the shortest way. Find the answer to these subtraction questions.

2. 40 − 11 60 − 14 50 − 21
3. 60 − 42 70 − 24 70 − 28
4. 40 − 25 50 − 31 80 − 32
5. 90 − 64 70 − 12 60 − 44

▶ Write the answers on folded paper. Subtract ones first.

6. $\begin{array}{r}36\\-23\\\hline\end{array}\quad\begin{array}{r}64\\-29\\\hline\end{array}\quad\begin{array}{r}70\\-47\\\hline\end{array}\quad\begin{array}{r}65\\-37\\\hline\end{array}\quad\begin{array}{r}42\\-31\\\hline\end{array}$

7. $\begin{array}{r}81\\-51\\\hline\end{array}\quad\begin{array}{r}70\\-26\\\hline\end{array}\quad\begin{array}{r}48\\-19\\\hline\end{array}\quad\begin{array}{r}61\\-14\\\hline\end{array}\quad\begin{array}{r}36\\-28\\\hline\end{array}$

8. $\begin{array}{r}73\\-49\\\hline\end{array}\quad\begin{array}{r}40\\-11\\\hline\end{array}\quad\begin{array}{r}90\\-77\\\hline\end{array}\quad\begin{array}{r}33\\-16\\\hline\end{array}\quad\begin{array}{r}87\\-48\\\hline\end{array}$

9. Check your answers to the last two subtractions in row 8. Use the place-value frame. Page 40 will help you.

No Pencils, Please!

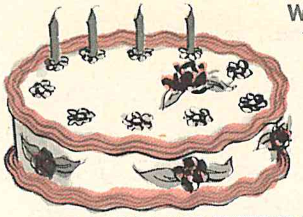
1. $17 + 10 + 10 + 10 + 2 = \square$
2. How much is 17 + 32?
3. How much is 22 + 32?
4. What is left if you take 11 from 50?
5. What is left if you take 24 from 40?
6. How many marks do you need to show the number 265 on a place-value frame?
7. What do you do when you borrow in this subtraction?

$$51 - 18 = \square$$

8. Do you have to borrow if you find the answer to 51 − 18 on the number line?
9. Just say the answers.

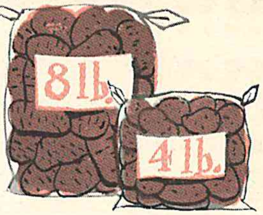
$\begin{array}{r}12\\-7\\\hline\end{array}\quad\begin{array}{r}42\\-9\\\hline\end{array}\quad\begin{array}{r}72\\-4\\\hline\end{array}\quad\begin{array}{r}52\\-8\\\hline\end{array}\quad\begin{array}{r}92\\-2\\\hline\end{array}$

HOW MANY ARE LEFT?



HOW MANY MORE ARE NEEDED?

WHAT IS THE DIFFERENCE?



Solving Three Kinds of Subtraction Problems

When you solve a word problem, you must read the problem very carefully. Notice what the problem tells you. Then read the question that the problem asks.

Here are some questions that you know a subtraction problem may ask. (Study page 30.)

a. One kind of subtraction problem asks how many are left, or how much is left.

b. Another kind of subtraction problem asks how many more are needed or how much more is needed.

c. A third kind of subtraction problem asks you to find the difference between two amounts.

1. Make up a problem for each picture at the top of this page. Use the question shown with the picture.

Think of the three subtraction questions. Tell which kind each of the following problems asks. Then answer the question.

2. Eighteen boys are needed to play baseball. There are 12 boys ready to play. How many more are needed?

3. Mr. Smith had 47 pounds of honey and sold 15 pounds. How many pounds are left?

4. A storybook costs 89¢. Mary has 64¢. How much more money does she need?

5. Mother must have 28 small cakes for a party. She has baked 12 of them. How many more must she bake?

6. There were 42 cookies on a baking sheet. Mary put 24 of them on a plate. How many were left on the baking sheet?

7. Jane weighs 78 pounds. Nancy weighs 63 pounds. What is the difference in their weights?

8. Edward is picking berries. He wants to fill 24 boxes. He has picked enough to fill 11 boxes. How many more boxes will he need to fill?

Choosing the Right Number Question

In some problems you add to answer the question the problem asks.

You add if the problem asks a question that means, "How many in all?"

In some problems you subtract to answer the question the problem asks.

You will know when to subtract if you remember what pages 30 and 31 taught you. Read these pages again.

For each problem think: "Must I add or subtract to answer the question the problem asks?"

1. During the 21 days at camp in 1955 there were 17 clear days. During the 1956 camp there were 13 clear days. You want to find how many more clear days of camp there were in 1955 than in 1956. Which number question will you use?

$$\begin{array}{r}21\\-17\\\hline\end{array}\qquad\begin{array}{r}17\\+13\\\hline\end{array}\qquad\begin{array}{r}17\\-13\\\hline\end{array}$$

Write the number questions needed for problems 2 through 5.

2. At camp some boys went on a hike. There were 9 older boys and 37 younger boys on the hike. How many boys were there in all?

3. The boys at the camp swam every day. One day they swam 90 minutes. The next day they swam 75 minutes. The first day they swam how many minutes more than the next day?

4. The boys played baseball. Team One had a score of 18. Team Two had a score of 7. The winners scored how much more than the losers?

5. It was 98 miles from Jack's house to camp by train. By automobile the distance was 79 miles. It was how many miles less by automobile than by train from Jack's home to the camp?

Don't Look Now!

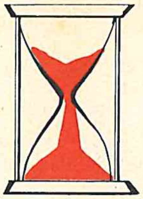
Only the teacher will look at the examples. She will read the questions. You will write only the answers. Number your paper from 6 through 14. Write your first answer after 6, and so on.

$$\textbf{6.}\ \begin{array}{r}16\\-7\\\hline\end{array}\qquad\textbf{7.}\ \begin{array}{r}13\\-8\\\hline\end{array}\qquad\textbf{8.}\ \begin{array}{r}9\\+6\\\hline\end{array}$$

$$\textbf{9.}\ \begin{array}{r}8\\+3\\\hline\end{array}\qquad\textbf{10.}\ \begin{array}{r}11\\-7\\\hline\end{array}\qquad\textbf{11.}\ \begin{array}{r}16\\-8\\\hline\end{array}$$

$$\textbf{12.}\ \begin{array}{r}32\\+20\\\hline\end{array}\qquad\textbf{13.}\ \begin{array}{r}30\\-11\\\hline\end{array}\qquad\textbf{14.}\ \begin{array}{r}40\\+12\\\hline\end{array}$$

Measuring Improvement—Test 2



Find out how well you can add and subtract. Write the answers on folded paper. The teacher will tell you when to start and when to stop.

1.	17	45	39	54
	+94	+58	+65	+57
2.	62	37	48	25
	+39	+56	+24	+45
3.	17	15	13	10
	−9	−7	−8	−7
4.	14	10	9	10
	−9	−2	−6	−4
5.	12	16	11	10
	−5	−9	−7	−3
6.	13	17	11	15
	−7	−8	−8	−6
7.	64	38	70	62
	−21	−18	−30	−29
8.	81	73	69	42
	−19	−36	−51	−27

Check your answers. At the top of your paper, write the figure that tells how many right answers you have. Write the date and how many minutes you took to do this test.

Call this test "Improvement Test 2." Put your paper in your arithmetic notebook.

Addition and Subtraction Practice

▶ Use folded paper. Write the answers. Watch the signs.

1.	8	7	4	4	9
	+3	+9	+7	+9	+6
2.	5	3	5	7	8
	+8	+8	+9	+6	+9
3.	3	9	6	8	6
	+9	+2	+5	+7	+8

4.	41	38	27	47
	+32	+84	+59	+56
5.	56	63	59	14
	+64	+48	+39	−6
6.	11	15	12	41
	−9	−8	−3	−18
7.	60	24	80	46
	−18	−6	−4	−3

Using Addition and Subtraction

Say the whole fact in rows 1-7.

1. $$\begin{array}{r} 9 \\ +\square \\ \hline 12 \end{array} \quad \begin{array}{r} 5 \\ +\square \\ \hline 14 \end{array} \quad \begin{array}{r} \square \\ +6 \\ \hline 9 \end{array} \quad \begin{array}{r} \square \\ +7 \\ \hline 14 \end{array} \quad \begin{array}{r} 6 \\ +5 \\ \hline \square \end{array}$$

2. $$\begin{array}{r} 11 \\ -\square \\ \hline 3 \end{array} \quad \begin{array}{r} 18 \\ -\square \\ \hline 9 \end{array} \quad \begin{array}{r} \square \\ +5 \\ \hline 12 \end{array} \quad \begin{array}{r} \square \\ -7 \\ \hline 8 \end{array} \quad \begin{array}{r} \square \\ +4 \\ \hline 10 \end{array}$$

3. $$\begin{array}{r} 9 \\ +\square \\ \hline 17 \end{array} \quad \begin{array}{r} 15 \\ -\square \\ \hline 9 \end{array} \quad \begin{array}{r} 13 \\ -\square \\ \hline 6 \end{array} \quad \begin{array}{r} 16 \\ -7 \\ \hline \square \end{array} \quad \begin{array}{r} \square \\ -9 \\ \hline 5 \end{array}$$

4. $12-\square=4$ $\quad$ $16-\square=9$
5. $10-\square=6$ $\quad$ $\square+8=14$
6. $9+\square=13$ $\quad$ $5+\square=11$
7. $16-\square=7$ $\quad$ $14-5=\square$

Tell whether you must add or subtract to find the answer.

8. How many are 15 minus 6?

9. How many are 9 and 9?

10. Five plus 9 is how much?

11. What is left when 6 is taken from 14?

12. Eight and 6 more are how many?

13. Twelve is how much larger than 8?

14. Seven and how many more equal 17?

15. Four and 5 put together are how many?

🟥 **Use only the facts that help you find the answer.**

Don forgot this when he wrote the number questions for the following problems.

Read each problem, and then read the number question that Don wrote for the problem. Is Don's number question right?

16. On March 16, Bob saw 3 flocks of geese. There were 14 geese in the first flock. There were 18 in the second flock and 9 in the third. How many geese did he see?

$3+14+18+9=\square$?

17. At 12 o'clock the thermometer read 11 degrees. At 3 o'clock it read 20 degrees. What was the difference between the two readings?

$20-11=\square$?

18. Jerry had 1 dog and 3 kittens. He bought 24 cans of dog food and 10 cans of cat food. The dog ate 6 cans of the dog food in 7 days. How many cans of the dog food were there left?

$24-7=\square$?

19. Solve problems 16 through 18 correctly.

ANN

$$\begin{array}{r} 6 \text{ hundreds } 4 \text{ tens } 7 \text{ ones} \\ -4 \text{ hundreds } 3 \text{ tens } 2 \text{ ones} \\ \hline 2 \text{ hundreds } 1 \text{ ten } 5 \text{ ones} \\ =215 \end{array}$$

CHARLES

hundreds
tens
ones

$$\begin{array}{r} 647 \\ -432 \\ \hline 215 \end{array}$$

BETTY

	hundreds	tens	ones
	II~~IIII~~	I~~III~~	IIIII~~II~~
Ans.	II	I	IIIII

Subtracting Three-Figure Numbers

1. The fat man at the circus weighs 647 pounds. The fat lady weighs 432 pounds. What is the difference in their weights?

Look at the way Ann, Betty, and Charles did their subtracting. Whose way do you like best?

2. Charles subtracted the shortest way. Explain his work. Begin by subtracting ones first.

3. Mr. Smith drove 536 miles. Mr. Brown drove 687 miles. Find the difference in the number of miles these men drove. Subtract the shortest way.

▶ Find answers the shortest way.

4. $\begin{array}{r} 478 \\ -254 \\ \hline \end{array}$ $\quad \begin{array}{r} 685 \\ -372 \\ \hline \end{array}$ $\quad \begin{array}{r} 943 \\ -612 \\ \hline \end{array}$ $\quad \begin{array}{r} 584 \\ -433 \\ \hline \end{array}$

5. $\begin{array}{r} 658 \\ -324 \\ \hline \end{array}$ $\quad \begin{array}{r} 576 \\ -421 \\ \hline \end{array}$ $\quad \begin{array}{r} 365 \\ -132 \\ \hline \end{array}$ $\quad \begin{array}{r} 943 \\ -721 \\ \hline \end{array}$

6. Bob's father has a filling station. Yesterday he sold 548 gallons of gasoline. Today he sold 419 gallons. He told Bob to find how many gallons less were sold today.

$$\begin{array}{r} 548 \\ -419 \\ \hline \end{array}$$

Bob wrote the subtraction question at the right. Then he told his father that he could not subtract 9 ones from 8 ones.

$$\begin{array}{r} 5\;\overset{3}{\cancel{4}}\;\boxed{{}^{1}8} \\ -4\;1\;9 \\ \hline \end{array}$$

To help Bob, his father wrote the subtraction like this.

How did Bob's father get the 18? Why did he write 3 above the 4 tens?

$$\begin{array}{r} 5\;\overset{3}{\cancel{4}}\;\boxed{{}^{1}8} \\ -4\;1\;9 \\ \hline 1\;2\;9 \end{array}$$

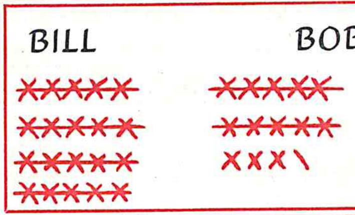
7. Bob then subtracted 9 ones from 18 ones. He wrote 9 in ones place in his answer. Explain the rest of his subtraction.

▶ Copy. Find the answers.

8. $\begin{array}{r} 647 \\ -428 \\ \hline \end{array}$ $\quad \begin{array}{r} 794 \\ -237 \\ \hline \end{array}$ $\quad \begin{array}{r} 893 \\ -544 \\ \hline \end{array}$ $\quad \begin{array}{r} 982 \\ -566 \\ \hline \end{array}$

9. $\begin{array}{r} 526 \\ -319 \\ \hline \end{array}$ $\quad \begin{array}{r} 781 \\ -238 \\ \hline \end{array}$ $\quad \begin{array}{r} 964 \\ -726 \\ \hline \end{array}$ $\quad \begin{array}{r} 458 \\ -239 \\ \hline \end{array}$

Borrowing Twice in Subtraction



A. $$\begin{array}{r} \overset{1}{\cancel{2}}\,\overset{9}{\cancel{0}}\,{}^{1}\textcircled{0} \\ -1\,3\,5 \\ \hline 6\,5 \end{array}$$

B. $$\begin{array}{r} \overset{3}{\cancel{4}}\,\overset{9}{\cancel{0}}\,{}^{1}\textcircled{3} \\ -2\,5\,7 \\ \hline 1\,4\,6 \end{array}$$

Bill and Bob were playing dominoes. Bill's score was 200. Bob's score was 135. Bob said, "If I count, I can see that you are 65 points ahead of me. But I cannot get that answer by subtracting 135 from 200."

1. Why is subtracting 135 from 200 hard for Bob?

Look at subtraction A in the picture. It shows 135 subtracted from 200. Think: "I cannot take 5 ones from 0 ones. I must borrow. Since there is a zero in tens place, I will think of the 2 hundreds as 20 tens.

"I will borrow one of the 20 tens. That will leave 19 tens.

"The ten I borrowed is 10 ones. I then think: 5 ones from 10 ones is 5 ones. Three tens from 9 tens is 6 tens. One hundred from 1 hundred leaves no hundreds. The difference is 65."

Find the differences.

2. $$\begin{array}{rrrr} 500 & 700 & 300 & 600 \\ -274 & -328 & -149 & -426 \\ \hline \end{array}$$

3. In subtraction B in the picture, how many tens were borrowed from hundreds place? To what were the 4 hundreds changed?

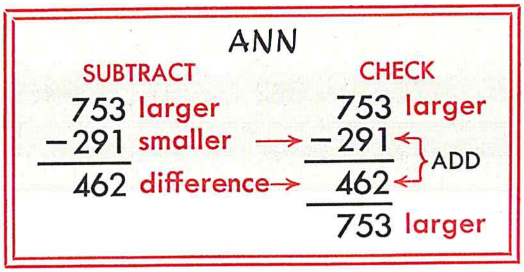
▶ Copy. Find the answers.

4. $$\begin{array}{rrrr} 300 & 807 & 402 & 750 \\ -125 & -256 & -175 & -166 \\ \hline \end{array}$$

5. $$\begin{array}{rrrr} 118 & 305 & 604 & 946 \\ -95 & -87 & -58 & -88 \\ \hline \end{array}$$

6. $$\begin{array}{rrrr} 302 & 603 & 280 & 312 \\ -151 & -256 & -165 & -186 \\ \hline \end{array}$$

Ann wants to be sure that she subtracts correctly. To check a subtraction, she adds the difference she gets to the number she subtracted. Explain her check.



▶ Copy. Find the answers. Check.

7. $$\begin{array}{rrrr} 674 & 437 & 514 & 528 \\ -287 & -159 & -365 & -289 \\ \hline \end{array}$$

How You Think When You Subtract

1. Mary is 8 years old. Her father is 37 years old. What is the difference in their ages?

Mary did her subtraction like this.

MARY

$$\begin{array}{r} 37 \\ -8 \\ \hline \end{array} \rightarrow \begin{array}{r} \overset{2}{\cancel{3}}\overset{1}{7} \\ -\ 8 \\ \hline 2\ 9 \end{array}\text{, or 29 years}$$

Father said the circle and the extra figures were good helpers. "But," he said, "after you know how to subtract, it is better not to write these helpers. Just think them."

He told Mary that you have to see ghost figures when you borrow in subtraction. A ghost figure is one you think you see, but it is not really there. Here is Mary's subtraction showing the ghost figures.

$$\begin{array}{r} \\ 3\ 7 \\ -\ 8 \\ \hline \end{array} \rightarrow \begin{array}{r} 2\ 17 \\ 3\ 7 \\ -\ 8 \\ \hline 2\ 9 \end{array}$$

2. Joe has 738 "trading" or "flip" cards. Bob has only 352 cards. Bob has how many fewer cards than Joe?

Tell where the ghost figures came from in the work below.

Real Example	Ghost Figures
$\begin{array}{r} 7\ 3\ 8 \\ -3\ 5\ 2 \\ \hline 3\ 8\ 6 \end{array}$ $\rightarrow$	$\begin{array}{r} 6\ 13\ \ \\ 7\ 3\ 8 \\ -3\ 5\ 2 \\ \hline 3\ 8\ 6 \end{array}$

3. Joan had 725 snapshots. Of these, 269 were in color. How many were not colored?

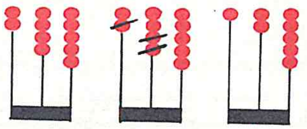
In Joan's subtraction, one ghost follows another. Tell where this parade of ghosts came from. Begin with 15.

Real Example	Ghost Figures
$\begin{array}{r} 7\ 2\ 5 \\ -2\ 6\ 9 \\ \hline 4\ 5\ 6 \end{array}$	$\begin{array}{r} 1\ 15 \\ 7\ 2\ 5 \\ -2\ 6\ 9 \\ \hline \end{array}$
JOAN	**More Ghost Figures** $\begin{array}{r} 6\ 11\ 15 \\ 7\ 2\ 5 \\ -2\ 6\ 9 \\ \hline 4\ 5\ 6 \end{array}$

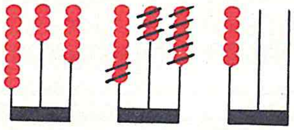
▶ Find the answers. Think the ghost figures as you subtract.

4. $\begin{array}{r} 673 \\ -196 \\ \hline \end{array}$ $\begin{array}{r} 451 \\ -283 \\ \hline \end{array}$ $\begin{array}{r} 765 \\ -398 \\ \hline \end{array}$ $\begin{array}{r} 842 \\ -555 \\ \hline \end{array}$

5. $\begin{array}{r} 525 \\ -278 \\ \hline \end{array}$ $\begin{array}{r} 964 \\ -677 \\ \hline \end{array}$ $\begin{array}{r} 734 \\ -395 \\ \hline \end{array}$ $\begin{array}{r} 432 \\ -157 \\ \hline \end{array}$



2 4 5 − 1 2 0 = 1 2 5



7 3 5 − 2 3 5 = 5 0 0

REMEMBER

$\begin{array}{r}5\\-0\\\hline 5\end{array}$ $\begin{array}{r}5\\-5\\\hline 0\end{array}$

Zeros in Subtraction

Cover the answers for rows 1-6. Write the answers on folded paper. Move your paper, and check your answers.

In these problems you subtract zero from a number.

1. $\begin{array}{r}365\\-110\\\hline 255\end{array}$ $\begin{array}{r}473\\-102\\\hline 371\end{array}$ $\begin{array}{r}964\\-200\\\hline 764\end{array}$ $\begin{array}{r}486\\-140\\\hline 346\end{array}$

2. $\begin{array}{r}428\\-305\\\hline 123\end{array}$ $\begin{array}{r}396\\-100\\\hline 296\end{array}$ $\begin{array}{r}746\\-501\\\hline 245\end{array}$ $\begin{array}{r}366\\-200\\\hline 166\end{array}$

■ **When zero is subtracted from a number, the answer is the same as the number.**

In these problems there are zeros in the answers.

3. $\begin{array}{r}379\\-169\\\hline 210\end{array}$ $\begin{array}{r}375\\-215\\\hline 160\end{array}$ $\begin{array}{r}569\\-365\\\hline 204\end{array}$ $\begin{array}{r}973\\-573\\\hline 400\end{array}$

4. $\begin{array}{r}842\\-372\\\hline 470\end{array}$ $\begin{array}{r}922\\-621\\\hline 301\end{array}$ $\begin{array}{r}363\\-223\\\hline 140\end{array}$ $\begin{array}{r}292\\-191\\\hline 101\end{array}$

■ **When a number is subtracted from an equal number, the answer is zero.**

In these problems you subtract from zero. (Study page 48 if you need help.)

5. $\begin{array}{r}280\\-134\\\hline 146\end{array}$ $\begin{array}{r}407\\-252\\\hline 155\end{array}$ $\begin{array}{r}720\\-346\\\hline 374\end{array}$ $\begin{array}{r}603\\-228\\\hline 375\end{array}$

6. $\begin{array}{r}750\\-483\\\hline 267\end{array}$ $\begin{array}{r}800\\-515\\\hline 285\end{array}$ $\begin{array}{r}406\\-212\\\hline 194\end{array}$ $\begin{array}{r}840\\-391\\\hline 449\end{array}$

▶ Write the answers on folded paper. Check. (Page 48 will help.)

7. $\begin{array}{r}605\\-105\\\hline\end{array}$ $\begin{array}{r}730\\-103\\\hline\end{array}$ $\begin{array}{r}500\\-306\\\hline\end{array}$ $\begin{array}{r}613\\-290\\\hline\end{array}$

8. $\begin{array}{r}701\\-329\\\hline\end{array}$ $\begin{array}{r}547\\-487\\\hline\end{array}$ $\begin{array}{r}570\\-195\\\hline\end{array}$ $\begin{array}{r}584\\-290\\\hline\end{array}$

▶ Copy. Write answers. Check.

9. $\begin{array}{r}788\\-597\\\hline\end{array}$ $\begin{array}{r}963\\-684\\\hline\end{array}$ $\begin{array}{r}379\\-187\\\hline\end{array}$ $\begin{array}{r}576\\-238\\\hline\end{array}$

10. $\begin{array}{r}758\\-473\\\hline\end{array}$ $\begin{array}{r}436\\-192\\\hline\end{array}$ $\begin{array}{r}682\\-495\\\hline\end{array}$ $\begin{array}{r}756\\-263\\\hline\end{array}$

11. $\begin{array}{r}647\\-198\\\hline\end{array}$ $\begin{array}{r}739\\-143\\\hline\end{array}$ $\begin{array}{r}658\\-374\\\hline\end{array}$ $\begin{array}{r}354\\-170\\\hline\end{array}$

12. $\begin{array}{r}516\\-327\\\hline\end{array}$ $\begin{array}{r}617\\-325\\\hline\end{array}$ $\begin{array}{r}439\\-206\\\hline\end{array}$ $\begin{array}{r}958\\-385\\\hline\end{array}$

Subtracting Dollars and Cents

Well! Well! What is happening here? Billy had a bad dream. He dreamed that the teacher had put big question marks by all of his subtraction examples.

Billy always got most of his answers right. He couldn't see why the teacher had questioned all of his answers.

▶ Copy all of the examples. Correct those that are wrong.

Billy Brown
Grade 4

Subtraction

1.
$1.63
−.95
$0.68 ?

2.
$15.77
−8.85
$6.92 ?

3.
$5.05
−1.96
$3.09 ?

4.
$7.35
−1.34
$5.01 ?

5.
$14.50
−4.71
$9.79 ?

6.
$75.00
−2.94
$72.06 ?

7.
$13.59
−7.74
$5.85 ?

8.
$17.86
−13.50
$4.26 ?

9.
$80.20
−14.15
$66.05 ?

10.
$11.94
−1.56
$9.38 ?

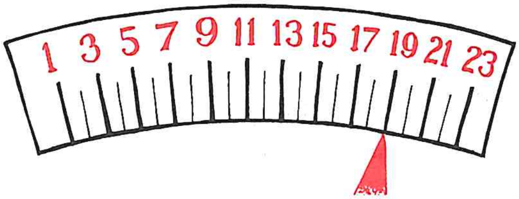
11.
$8.04
−.69
$7.35 ?

12.
$1.43
−.97
$0.66 ?

Important Things to Remember

- Place a dollar sign before the first money number that you write in an example.
- Put the cents point before the number of cents in each money number in your example.
- Keep the cents point in the second money number directly under the cents point in the first money number that you write.
- Write the dollar sign before your answer.

How Well Have You Learned?



Doing these exercises will help you find how well you have learned what you studied in this unit.

Write a subtraction question for each of these statements.

1. Henry is 8 years old. Joe is 11 years old.

2. Bob lost 5 of his seven toy soldiers.

3. Betty packed her 12 dolls in two boxes. In the first box, she put 4 dolls.

Answer these questions.

4. Tell 3 different ways to study a subtraction fact such as $8-2=6$.

5. Make two sets of numbers to use in the subtraction race game.

6. Show the subtraction $46-18$ on a number line.

7. Use a place-value frame. Subtract 17 from 64 on it.

8. Write several subtraction facts to show that there are subtraction families.

9. Show two ways of checking $36-23=13$.

10. Subtraction is used to answer how many different kinds of number questions?

11. Can the questions "How many more?" and "What is the difference?" be used for the same number statement?

12. How many dots would you use to show $7-4=3$ in a dot drawing?

13. Is the answer to $40-13$ the same as the answer to $40-10-3$?

Find the answers.

14. 24¢ + 12¢ + 35¢ + 21¢

15. 95¢ − 45¢ 80¢ − 39¢

16. $\begin{array}{r} 58 \\ +69 \\ \hline \end{array}$ $\begin{array}{r} 96 \\ -28 \\ \hline \end{array}$ $\begin{array}{r} 532 \\ -180 \\ \hline \end{array}$ $\begin{array}{r} \$5.27 \\ -2.38 \\ \hline \end{array}$

17. $6.25 − $3.05 800 − 327

18. 503 − 502 712 − 589

19. 6 + 7 + 4 + 2 + 9

20. 3 + 6 + 2 + 0 + 8

21. 156 + 75 327 − 58

22. $\begin{array}{r} 451 \\ -200 \\ \hline \end{array}$ $\begin{array}{r} 589 \\ +318 \\ \hline \end{array}$ $\begin{array}{r} 541 \\ -190 \\ \hline \end{array}$ $\begin{array}{r} 374 \\ -95 \\ \hline \end{array}$

23. $1.50 + $4.75 413 − 247

Helping Yourself

You should be able to do the work on this page well. In places where you have trouble, study the pages given in color. Your work will be easier later on if you know this work well.

1. The number one hundred fifty is equal to how many tens? (24)

2. How many marks would you use to show the number one thousand on a place-value frame? (18)

3. How many are twenty-four and thirty? (12)

4. What is $60 - 20 - 6$? (37)

5. Fifty minus 30 equals what? (38)

6. Begin with 17. Count by threes until you pass 40. (18)

7. What number is 2 tens less than 6 tens and 4 ones? (38)

8. In the number 402, there are how many tens? (18)

9. In the example $402 - 163 = \square$, how many tens are left after you change a ten to ten ones? (48)

10. How can you check the difference after you take 163 from 402? (48)

11. How much is 500 minus 426? (48)

12. Sixty minus fifteen is how much? (39)

13. To show the number three thousand sixty-two on a place-value frame, how many marks are needed? (18)

Remember: A three-figure number can be thought of in different ways. For example, 345 may be thought of as:

3 hundreds, 4 tens, and 5 ones; or
34 tens and 5 ones; or
345 ones; or
30 tens and 45 ones.

14. In what four ways can you think of 278? Of 139? Of 726? (18)

Copy. Write the answers. Check.

15. $\begin{array}{r} 60 \\ -29 \\ \hline \end{array}$ $\begin{array}{r} 32 \\ -19 \\ \hline \end{array}$ $\begin{array}{r} 76 \\ -38 \\ \hline \end{array}$ $\begin{array}{r} 47 \\ -16 \\ \hline \end{array}$ (40)

16. $\begin{array}{r} 701 \\ -483 \\ \hline \end{array}$ $\begin{array}{r} 862 \\ -493 \\ \hline \end{array}$ $\begin{array}{r} 901 \\ -506 \\ \hline \end{array}$ (48)

17. $\begin{array}{r} 700 \\ -261 \\ \hline \end{array}$ $\begin{array}{r} 803 \\ -195 \\ \hline \end{array}$ $\begin{array}{r} 656 \\ -482 \\ \hline \end{array}$ (48)

18. $\begin{array}{r} 750 \\ -261 \\ \hline \end{array}$ $\begin{array}{r} 367 \\ -195 \\ \hline \end{array}$ $\begin{array}{r} 500 \\ -117 \\ \hline \end{array}$ (48)

19. $\begin{array}{r} 401 \\ -391 \\ \hline \end{array}$ $\begin{array}{r} 429 \\ -189 \\ \hline \end{array}$ $\begin{array}{r} 981 \\ -408 \\ \hline \end{array}$ (48)

How Well Are You Doing?

1. Gary had 96 newspapers to sell. He sold all but 16 of them. How many did he sell?

2. Gary bought a raincoat for $8.79. He gave the salesman $10.00. How much money should Gary get back?

3. A storybook costs $1.98. Mary has $1.50. How much more money must she get before she can buy the book?

4. There must be eighteen players to play a baseball game. Twelve boys are ready to play. How many more boys are needed for the game?

5. Jim threw a ball 130 feet. Bob threw a ball 97 feet. How much farther did Jim throw the ball?

6. A model airplane was on sale for $8.95. The salesman said the same plane had once cost $12.50. How much did Jerry save by buying the airplane at the sale price?

7. Joan spent 39¢ for toothpaste and 45¢ for candy. What did she spend in all?

8. Ruth read 112 pages of her storybook. There are 200 pages in the book. How many more pages must she read to finish the book?

9. John has saved $3.25 in his penny bank. How many pennies is this?

10. Write the number that stands for 3 hundreds and 32 ones.

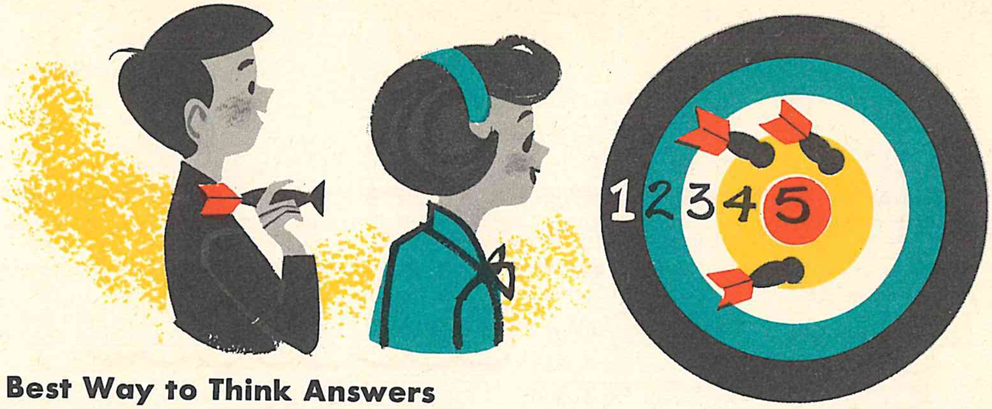
11. Write the largest number that you can, using the figures 5, 2, and 9.

12. Write the largest number that you can, using 0, 5, and 3.

13. Bill saves pictures of baseball players. He has 139 pictures that are colored and 61 pictures that are not colored. How many pictures has he in all?

14. Jim has a pack of 100 picture postcards about large cities. He has 40 postcards showing famous parks, and 9 postcards of famous mountain peaks. How many postcards has he in all? A short way to answer is to think:

⍰ hundreds, ⍰ tens, ⍰ ones, or ⍰⍰⍰.



The Best Way to Think Answers

Fred threw three darts. The darts hit in the space shown in the picture. Fred said, "Four and four are eight. Eight and four equal how much?"

While he was trying to get his answer, Carol said, "Why don't you just think three fours? That is a much better way to get the answer."

1. If Fred had finished thinking his way, what answer would he have gotten?

2. What would be the answer if you found it using Carol's way?

3. What good reason might Carol have for thinking that her way of getting the answer was better than Fred's?

Try to answer questions 4, 5, and 6 by just thinking the answer as Carol suggested.

4. One nickel is equal to 5 cents. Four nickels are equal to how many cents?

5. Six threes are equal to what number?

6. How many are seven twos?

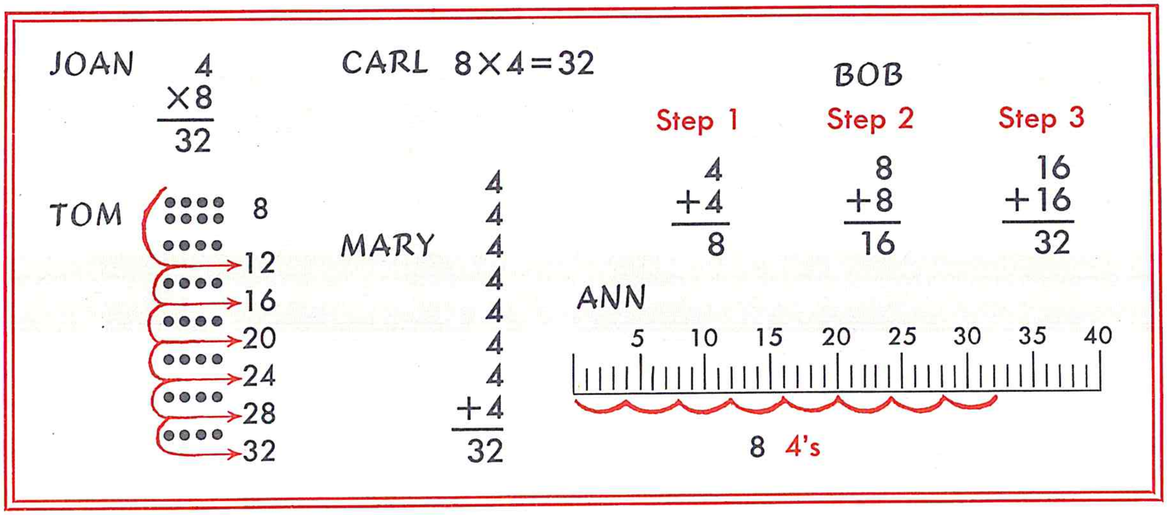
■ **When you just think the answer to number questions like "How many are six threes?" you are multiplying.**

■ **You can check multiplication by adding.**

Such number questions as "How many are six threes?" and "Four fives are how many?" are written with numbers in this way.

Multiplication Number Questions

$$\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$$



Showing That Answers to Multiplication Questions Are Right

As the delivery man carried the last four bricks from the truck, he said, "This will make 8 trips. In 8 trips I carried 32 bricks."

1. Did the delivery man figure correctly? Make sure you answered correctly by finding the answer in two ways.

2. In one fourth grade some children were not sure about the way the multiplication should be written. Look at the two ways below. Which way is correct?

$$\begin{array}{r}8\\ \times 4\\ \hline\end{array} \qquad \begin{array}{r}4\\ \times 8\\ \hline\end{array}$$

3. The teacher asked six children to go to the board. Each child was to show eight fours in his own way. Explain each child's way.

▶ Use folded paper. Answer these multiplication questions.

4.	$\begin{array}{r}3\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 2\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 5\\ \hline\end{array}$
5.	$\begin{array}{r}2\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 8\\ \hline\end{array}$
6.	$\begin{array}{r}4\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 9\\ \hline\end{array}$
7.	$\begin{array}{r}4\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 9\\ \hline\end{array}$

8. Check your answers for row 4 by adding. Use Tom's way or Mary's.

9. Check your answers for row 5 using Bob's way.

Another Way to Answer Multiplication Questions

Jim was not sure that he knew the answer to 7×3. He separated the multiplier 7 into two parts. He thought, "4 and 3 equal 7." He multiplied 3 by each part of 7. Then he added the two products. Look at his work.

JIM

$$\begin{array}{r}3\\ \times 7\\ \hline\end{array} = \overbrace{\begin{array}{r}3\\ \times 4\\ \hline 12\end{array} \quad \text{and} \quad \begin{array}{r}3\\ \times 3\\ \hline 9\end{array}}$$

$$\begin{array}{r}12\\ +9\\ \hline 21\end{array}$$

1. Did Jim get the right answer?

▶ Find the answers to these questions by multiplying twice as Jim did.

2. $\begin{array}{rrrrrr}4 & 5 & 2 & 4 & 3 & 4\\ \times 5 & \times 7 & \times 8 & \times 7 & \times 8 & \times 7\\ \hline\end{array}$

3. $\begin{array}{rrrrrr}3 & 2 & 4 & 5 & 3 & 2\\ \times 9 & \times 7 & \times 9 & \times 6 & \times 5 & \times 6\\ \hline\end{array}$

4. Check your answers for row 2 by using a number line.

5. Can you tell how Jim's way is different from Bob's way given on page 56?

When the children were talking about the different ways to answer multiplication questions, they found it useful to know certain names, or terms.

$$\begin{array}{rl}4 & \text{multiplicand}\\ \times 9 & \text{multiplier}\\ \hline 36 & \text{product}\end{array}$$

6. In the example that Bill wrote, which number is the product?

$$\begin{array}{r}2\\ \times 3\\ \hline 6\end{array} \quad \text{BILL}$$

7. Write a multiplication example with 5 for a multiplicand.

8. Is the product of 4×2 equal to the product 2×4?

■ **The basic multiplication facts are the facts in which a one-figure number is multiplied by another one-figure number.**

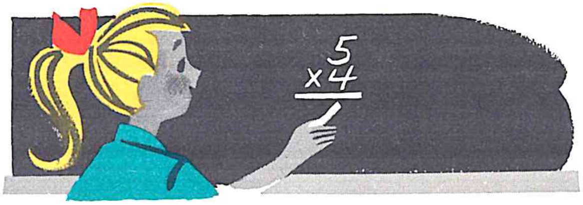
Basic Multiplication Fact

$$\begin{array}{r}3\\ \times 4\\ \hline 12\end{array}$$

9. Write a basic multiplication fact using 5 and 4.

10. Write a basic multiplication fact with 2 for the multiplier.

Basic Multiplication Questions



Look at the number question Ann has written on the board. Ann says that this number question is a basic multiplication question. Can you explain what Ann meant?

Here are thirty-two easy basic multiplication questions. Try to answer each question as soon as you read it.

1.	$\begin{array}{r}4\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 2\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 7\\ \hline\end{array}$
2.	$\begin{array}{r}4\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 5\\ \hline\end{array}$
3.	$\begin{array}{r}3\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 5\\ \hline\end{array}$
4.	$\begin{array}{r}3\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 2\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 6\\ \hline\end{array}$
5.	$\begin{array}{r}4\\ \times 2\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 6\\ \hline\end{array}$
6.	$\begin{array}{r}5\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}2\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}3\\ \times 2\\ \hline\end{array}$
7.	$\begin{array}{r}4\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 4\\ \hline\end{array}$
8.	$\begin{array}{r}5\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}5\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}4\\ \times 8\\ \hline\end{array}$

Could you give the answer to each question as soon as you read the question?

If you could not, study the fact for any question that you could not answer quickly.

Remember: A fact is the number question and its answer.

How to Study Multiplication Facts

- Read the fact carefully. For $\begin{array}{r}3\\ \times 6\\ \hline 18\end{array}$ say, "Six 3's = 18."
- Then close your eyes and think the fact.
- Next, open your eyes and look at the fact. Is the fact exactly as you thought it? If not, read the fact again.
- Close your eyes. Think the fact again. Go through these steps until you know a fact well.

- Cover the product part of a fact. Try to give the product.
- Then uncover the product to see if the product you gave was correct.

Studying Multiplication

Use folded paper. Cover the products in the first row of basic multiplication facts below. Write each product on the folded paper.

Uncover the products. Check the products that you wrote.

Study the basic multiplication facts in the other rows in the same way.

1. $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$ $\quad\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$ $\quad\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$ $\quad\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$

2. $\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$ $\quad\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$ $\quad\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ $\quad\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$

3. $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$ $\quad\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$ $\quad\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$ $\quad\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$

4. $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$ $\quad\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$ $\quad\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$ $\quad\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$

5. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$ $\quad\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$ $\quad\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$ $\quad\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$

6. $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$ $\quad\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$ $\quad\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$ $\quad\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$

It is very important to understand clearly what you are doing when you just think the answer to a multiplication question.

Three ways of showing the basic multiplication fact 4×3=12 are given below.

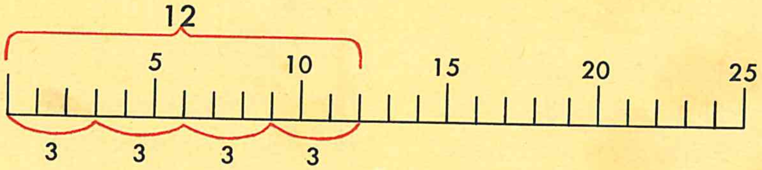
7. Use each of the three ways to show any of the multiplication facts on this page.

A. ●●● ●●● ●●● ●●● = ●●●●●●●●●●●●

3 3 3 3 12

B. 3 + 3 + 3 + 3 = 12

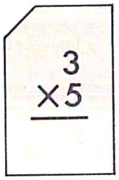
C.



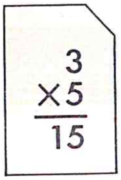
Using Basic Multiplication Fact Cards

Cards like the one pictured here are very helpful in learning the basic multiplication facts.

FRONT



BACK



This is the way Jack used such cards to study.

First he stacked the cards so that all the cut-off corners were at his left. That meant that the number question side was up on every card.

Jack then read and answered the question on the top card. He next turned the card over to see if he had given the right answer. He did this until he had used all of the cards.

When Jack found he had not given the right answer, he put the fact card in a special-study stack. He studied the cards in the special-study stack using the way given on page 58.

Make basic multiplication fact cards for 2's, 3's, 4's, and 5's. Page 325 will help you.

Use your fact cards as Jack used his. Learn every fact well.

Write Answers Only

1. How many zeros are needed to write the number one hundred sixty thousand?

2. Three tens minus eight equals what number?

3. If you showed two hundred thirty-five on a place-value chart, how many marks would you use?

4. What is the sum of each of these pairs of numbers?
   thirty-two and nine
   sixteen and seven
   ninety-six and eight

5. What is 43 minus 8, plus 5, minus 10?

6. If you begin with 38 and count up by 4's, what is the first fifty number you say?

You can tell what the number 492 means in these different ways.

7. 492 means 400+90+▨.

8. 492 means ▨ hundreds, ▨ tens, 2 ones.

9. 492 means ▨ tens and 2 ones.

10. 492 means ▨ ones.

11. 492 is about how many even hundreds?

Multiplying a Two-Figure Number

Bill and Frank lived near a lake where people fished. They made money by selling fishing worms.

One day Frank, who was only 8 years old, was alone at their stand. A fisherman asked Frank for 4 dozen worms.

Frank knew there were 12 worms to the dozen, but he did not know how many four 12's equaled.

1. Frank counted 12 worms into a can, then 12 more, then 12 more, and then 12 more. Did he count out 4 dozen worms for the man?

2. Bill is much older than Frank. If Bill had been at the stand, he would have counted all the worms in one count. Would his way be better than Frank's way?

3. To find how many 4 dozen are, is it better to add or to multiply?

4. In answering question 3, Ann said it is easier to multiply. She wrote the multiplication this way. She said, "Four 2's = 8; four 1's = 4." Why did Ann write the 4 in tens place?

$$\begin{array}{r}12\\ \times 4\\ \hline 48\end{array}$$

Copy. Find the answers by multiplying. Check your answers by adding.

5. $\begin{array}{r}21\\ \times 4\\ \hline\end{array}$ $\quad\begin{array}{r}32\\ \times 3\\ \hline\end{array}$ $\quad\begin{array}{r}12\\ \times 3\\ \hline\end{array}$ $\quad\begin{array}{r}42\\ \times 2\\ \hline\end{array}$ $\quad\begin{array}{r}31\\ \times 2\\ \hline\end{array}$

Bill said Ann could have used figures and words when she multiplied. Look at Bill's work.

BILL

$$\begin{array}{rcl}12 & = & 1 \text{ ten } 2 \text{ ones}\\ \times 4 & & \times 4\\ \cline{1-1}\cline{3-3} & & 4 \text{ tens } 8 \text{ ones} = 48\end{array}$$

6. Why do you think Ann used her way instead of multiplying as Bill did?

▶ Copy. Find the answers. Check each answer by using figures and words as Bill did.

7. $\begin{array}{r}31\\ \times 3\\ \hline\end{array}$ $\quad\begin{array}{r}22\\ \times 4\\ \hline\end{array}$ $\quad\begin{array}{r}21\\ \times 2\\ \hline\end{array}$ $\quad\begin{array}{r}13\\ \times 3\\ \hline\end{array}$ $\quad\begin{array}{r}34\\ \times 2\\ \hline\end{array}$

RUTH

$$\begin{array}{r} 24 \\ \times 3 \\ \hline \end{array} = \begin{array}{rr} 2 \text{ tens} & 4 \text{ ones} \\ & \times 3 \\ \hline 6 \text{ tens} & 12 \text{ ones} = 72 \end{array}$$

BOB

$$\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$$

THINK

(3×4 = 12. Write the 2 in ones place and carry the ten. 3×2 tens = 6 tens and the 1 carried ten = 7 tens. Write the 7 in tens place.)

Carrying in Multiplication

Ruth and Bob wanted to find out how many three 24's are. Each multiplied in a different way. The two different ways are shown above.

1. In Ruth's example, how were the 7 tens in her last product found?

2. How can you show that the 6 in Ruth's example is 6 tens without using the word "tens"?

3. In Bob's example, is the number carried a ten or a one?

▶ Copy. Find the product for these examples. Use the way that Ruth used.

4. $\begin{array}{r}26\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}34\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}17\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}25\\ \times 5\\ \hline\end{array}$

▶ Copy. Find the products for these examples. Use the way that Bob used.

5. $\begin{array}{r}36\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}14\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}15\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}33\\ \times 5\\ \hline\end{array}$

6. $\begin{array}{r}16\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}38\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}46\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}12\\ \times 5\\ \hline\end{array}$

7. Which way of carrying is shorter, Ruth's way or Bob's?

▶ Copy. Find the products. Use the shorter way.

8. $\begin{array}{r}26\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}43\\ \times 5\\ \hline\end{array}\quad \begin{array}{r}37\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}14\\ \times 5\\ \hline\end{array}$

9. $\begin{array}{r}25\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}42\\ \times 5\\ \hline\end{array}\quad \begin{array}{r}29\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}74\\ \times 3\\ \hline\end{array}$

10. $\begin{array}{r}54\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}24\\ \times 6\\ \hline\end{array}\quad \begin{array}{r}38\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}19\\ \times 5\\ \hline\end{array}$

11. $\begin{array}{r}48\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}85\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}56\\ \times 5\\ \hline\end{array}\quad \begin{array}{r}39\\ \times 4\\ \hline\end{array}$

12. $\begin{array}{r}53\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}42\\ \times 9\\ \hline\end{array}\quad \begin{array}{r}44\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}85\\ \times 5\\ \hline\end{array}$

13. $\begin{array}{r}28\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}39\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}47\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}28\\ \times 5\\ \hline\end{array}$

14. $\begin{array}{r}37\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}56\\ \times 2\\ \hline\end{array}\quad \begin{array}{r}25\\ \times 5\\ \hline\end{array}\quad \begin{array}{r}46\\ \times 4\\ \hline\end{array}$

Addition, Subtraction, and Multiplication Practice

▶ Use folded paper. Write answers only.

1. $\begin{array}{r}36\\+74\\\hline\end{array}$ $\begin{array}{r}16\\+19\\\hline\end{array}$ $\begin{array}{r}25\\+45\\\hline\end{array}$ $\begin{array}{r}17\\+16\\\hline\end{array}$

2. $\begin{array}{r}36\\35\\20\\+43\\\hline\end{array}$ $\begin{array}{r}12\\31\\4\\+29\\\hline\end{array}$ $\begin{array}{r}32\\8\\29\\+16\\\hline\end{array}$ $\begin{array}{r}43\\28\\75\\+37\\\hline\end{array}$

3. $\begin{array}{r}36\\-18\\\hline\end{array}$ $\begin{array}{r}40\\-24\\\hline\end{array}$ $\begin{array}{r}74\\-23\\\hline\end{array}$ $\begin{array}{r}35\\-17\\\hline\end{array}$

4. $\begin{array}{r}255\\-167\\\hline\end{array}$ $\begin{array}{r}190\\-121\\\hline\end{array}$ $\begin{array}{r}403\\-157\\\hline\end{array}$ $\begin{array}{r}917\\-483\\\hline\end{array}$

5. $\begin{array}{r}22\\\times5\\\hline\end{array}$ $\begin{array}{r}35\\\times3\\\hline\end{array}$ $\begin{array}{r}13\\\times4\\\hline\end{array}$ $\begin{array}{r}43\\\times5\\\hline\end{array}$

6. Use subtraction. Check your answers to the first two examples in row 1.

7. Use the mark-out check. Check your answers to the last three examples in row 2.

8. Use addition. Check the first three examples in row 4.

9. Use addition. Check your answers to the last three examples in row 5.

9

10. Look at the practice given below. Can you think of a good reason for calling it "mixed" practice?

▶ Use folded paper. Write the answers. Watch the signs very carefully.

11. $\begin{array}{r}35\\\times4\\\hline\end{array}$ $\begin{array}{r}58\\-39\\\hline\end{array}$ $\begin{array}{r}84\\+70\\\hline\end{array}$ $\begin{array}{r}60\\-29\\\hline\end{array}$

12. $\begin{array}{r}36\\\times3\\\hline\end{array}$ $\begin{array}{r}76\\\times3\\\hline\end{array}$ $\begin{array}{r}84\\\times5\\\hline\end{array}$ $\begin{array}{r}43\\\times9\\\hline\end{array}$

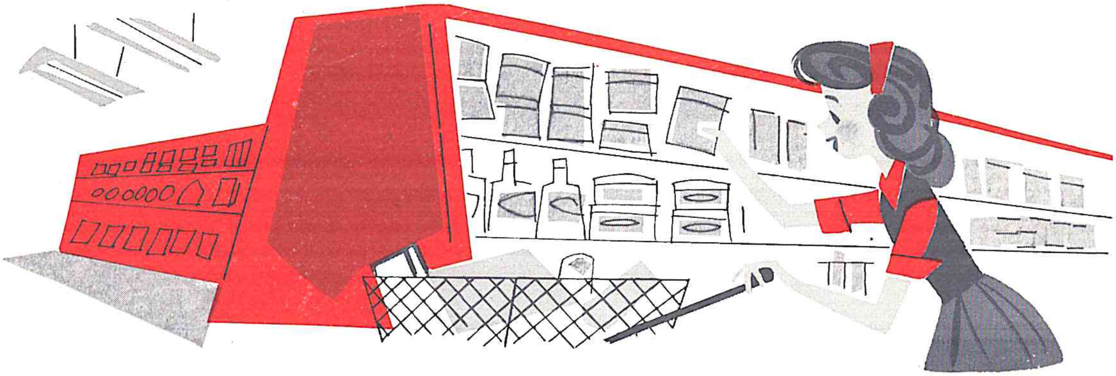
13. $\begin{array}{r}\$6.75\\-4.59\\\hline\end{array}$ $\begin{array}{r}\$6.26\\+3.02\\\hline\end{array}$ $\begin{array}{r}900\\-895\\\hline\end{array}$

14. $\begin{array}{r}532\\26\\468\\7\\+89\\\hline\end{array}$ $\begin{array}{r}\$\ \ .74\\53.09\\2.10\\14.25\\+.89\\\hline\end{array}$ $\begin{array}{r}41\\320\\9\\56\\+45\\\hline\end{array}$

15. $\begin{array}{r}\$95.00\\-6.41\\\hline\end{array}$ $\begin{array}{r}\$1.45\\-.68\\\hline\end{array}$ $\begin{array}{r}5422\\+1823\\\hline\end{array}$

16. $\begin{array}{r}\$25.09\\+8.43\\\hline\end{array}$ $\begin{array}{r}75\\\times3\\\hline\end{array}$ $\begin{array}{r}31\\\times4\\\hline\end{array}$

17. $\begin{array}{r}38\\+14\\\hline\end{array}$ $\begin{array}{r}78\\-49\\\hline\end{array}$ $\begin{array}{r}500\\-152\\\hline\end{array}$ $\begin{array}{r}15\\\times4\\\hline\end{array}$



Addition, Subtraction, and Multiplication Problems

Look at problems 1, 2, 3, and 4. Is it best to add, to subtract, or to multiply to answer the question each problem asks?

1. At the vegetable stand Jane picked up 3 bags of carrots and 2 bunches of celery. There were 6 carrots in each bag. How many carrots did she buy?

2. At the meat counter Jane got 3 steaks. The steaks were marked 43¢, 41¢, and 52¢. What was the total price of the meat she got?

3. In another section Jane got a 39¢ box of soap and 2 cans of kitchen cleanser that were marked, "2 for 25¢." What did these three things cost?

4. When Jane paid her bill, the clerk added the prices of these things on the adding machine. The clerk said, "Two dollars and sixty-four cents." Jane gave him a five-dollar bill. How much change should she get back?

Find the answers to the questions in problems 5, 6, 7, and 8.

5. Jack delivers papers. He was collecting from one of his customers. Jack said, "You owe me for 3 weeks at 35 cents a week." How much in all did the customer owe Jack for the 3 weeks?

6. One customer owed only 35¢. He gave Jack a dollar bill. As Jack counted out the change, he gave the customer a nickel, a dime, and two quarters. Did Jack give the right change?

7. When Jack finished collecting, he had $2.25 in quarters, $3.50 in fifty-cent pieces, $8.00 in one-dollar bills, and $3.40 in nickels and pennies. How much money did he have?

8. Jack figured he walked about four miles each day delivering papers. About how far would he walk in delivering the papers in one week of 7 days?

Multiplying Ones and Zeros

$$\begin{array}{r}31\\ \times 5\\ \hline 155\end{array}\qquad\begin{array}{r}12\\ \times 3\\ \hline 36\end{array}\qquad\begin{array}{r}14\\ \times 2\\ \hline 28\end{array}\qquad\begin{array}{r}21\\ \times 4\\ \hline 84\end{array}$$

The fourth-grade teacher said, "Some of you are not sure of your work when you multiply a one. Study the examples on the board and try to make up a rule for multiplying a one. When you think of a rule, use the examples to show how the rule works."

1. What is the rule that the teacher meant?

2. One of the pupils wrote the facts below to show how the rule works.

$5 \times 1 = 5$ $3 \times 1 = 3$
$2 \times 1 = 2$ $4 \times 1 = 4$

What do you notice about the multiplier and the product in each of the facts that the pupil wrote?

3. Jerry said, "Any time you have a one in multiplication, the product is the other number." Test Jerry's rule by copying these questions and writing the products.

$4 \times 1 =$ ⍰ $1 \times 7 =$ ⍰
$7 \times 1 =$ ⍰ $1 \times 9 =$ ⍰

■ **When one of the two numbers in a multiplication question is one, as 6×1 or 1×6, the product is the other number.**

4. Write five facts in which you use the rule given in column 1.

The examples below will help you make a rule for multiplying zero.

ANN $\begin{array}{r}10\\ \times 8\\ \hline 80\end{array}$ BETTY $\begin{array}{r}20\\ \times 3\\ \hline 60\end{array}$

CARL $\begin{array}{r}30\\ \times 5\\ \hline 150\end{array}$ DON $\begin{array}{r}40\\ \times 4\\ \hline 160\end{array}$

Use the examples above and answer these questions.

5. What numbers were multiplied to get the zero in Ann's product? In Betty's product?

6. Write the number fact Carl used to get the zero in his product. Write the number fact Don used to get the zero in his product.

■ **When zero is multiplied, the product is always zero.**

7. Write five facts in which you use the rule for multiplying zero.

MULTIPLICATION TABLES FOR 2'S, 3'S, 4'S, AND 5'S

TABLE FOR 2'S	TABLE FOR 3'S	TABLE FOR 4'S	TABLE FOR 5'S
1×2= 2	1×3= 3	1×4= 4	1×5= 5
2×2= 4	2×3= 6	2×4= 8	2×5=10
3×2= 6	3×3= 9	3×4=12	3×5=15
4×2= 8	4×3=12	4×4=16	4×5=20
5×2=10	5×3=15	5×4=20	5×5=25
6×2=12	6×3=18	6×4=24	6×5=30
7×2=14	7×3=21	7×4=28	7×5=35
8×2=16	8×3=24	8×4=32	8×5=40
9×2=18	9×3=27	9×4=36	9×5=45

Multiplication Tables for 2's, 3's, 4's, and 5's

Jerry said, "My mother asked if we were going to learn the multiplication tables. What did my mother mean?"

The teacher said, "When the basic multiplication facts are arranged in order, they are called the multiplication tables."

You know the facts for the multiplication tables for 2's, 3's, 4's, and 5's. Here is how the facts look when arranged in order in tables.

Saying the multiplication tables is a good way to learn the basic multiplication facts well.

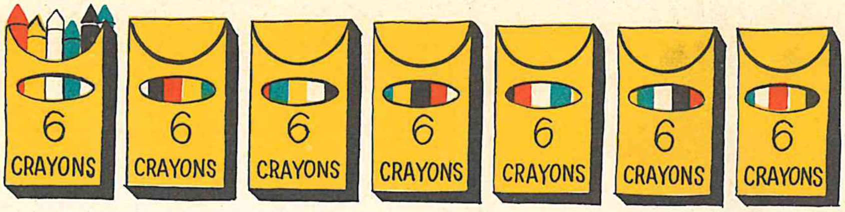
1. Read the table for 2's. Now put your hand over the table. Try to say the facts in the order given in the table.

2. Read the table for 3's. Cover the table. See if you can say the facts for 3's in order.

3. Read the tables for 4's and 5's. Then try to say the facts for 4's and 5's in order.

4. Can you count quickly by 2's, 3's, 4's, and 5's? If not, cover the products in each table. Practice giving the products in order very quickly.

Multiplying 6's



The pupils in the art class needed some crayons. They got seven boxes of crayons from the school supply room. How many crayons did the class get?

1. To find how many crayons there were, Jim thought this way, "I believe that five 6's = 30, and two 6's = 12. That makes 42." What would be a good way to find out if Jim's answer was correct?

2. What multiplication number question could be used to find how many crayons were brought from the supply room?

3. The crayons in only four boxes were used immediately. Write the multiplication question that could be used to find how many crayons were used immediately.

4. Use addition to find how many four 6's equal.

Try to think the answers to questions 5, 6, 7, and 8. Check by adding or by counting.

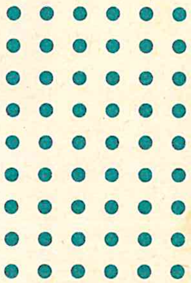
5. How many are three 6's?

6. How many are nine 6's?

7. Eight 6's equal what number?

8. Five 6's equal what number?

For use in counting to find the answer to such questions as 5, 6, 7, and 8, Joe made this dot picture.



9. Use Joe's dots. Count to see what number five 6's equal.

10. Use the dot picture to check the facts below.

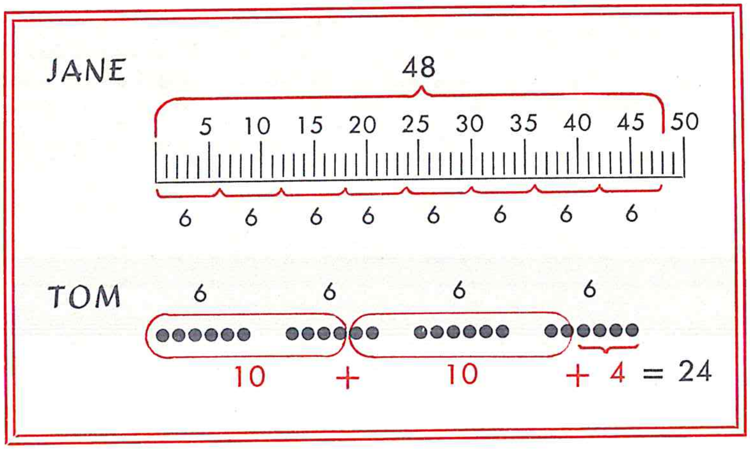
$$\begin{array}{r}6\\ \times 6\\ \hline 36\end{array} \qquad \begin{array}{r}6\\ \times 9\\ \hline 54\end{array} \qquad \begin{array}{r}6\\ \times 4\\ \hline 24\end{array}$$

Sue did not use dots as Joe did. She used Jim's way to make sure her products were right.

11. For "Four 6's equal what number?" she thought, "Two 6's and two 6's." What else did she think to get the number?

12. How could Sue think to answer the question, "Eight 6's equal what number?" To answer, "Nine 6's equal what number?"

Studying the 6's



Read these facts carefully.

1. $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$ $\quad\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$ $\quad\begin{array}{r} 6 \\ \times 1 \\ \hline 6 \end{array}$ $\quad\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$

2. $\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$ $\quad\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$ $\quad\begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array}$ $\quad\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$

3. Cover the products in the facts above. Read each question and try to think the answer.

4. Study the facts you do not know well. Use the read-and-think way that you used on page 58.

5. To be sure that you know what the 6's mean in multiplication, show each of the facts above on a number line. Look at Jane's number line for the first fact in row 1. It is at the top of the page.

Another way to show 6's in multiplication is to rearrange groups of 6's into groups of 10's. Tom used this way to show 4×6 = 24. Look at Tom's work in the picture at the top of the page.

6. Use Tom's way. Show that 7×6 = 42; 5×6 = 30; and 9×6 = 54.

7. Make a multiplication table of the 6's.

8. Use your table. Cover the products and see how fast you can give them.

9. Cover your table. Try to say the facts in the table very quickly and in the order given in your table.

10. Begin with 6. Count by 6's to 48.

11. Cover the multiplication table you wrote for the 6's. See how fast you can write this table. Check with your table to see if your work is correct.

Multiplying 7's

Try to think the answer to each question. Check by adding or multiplying twice.

1. John was in summer camp for 8 weeks. How many days was that? There are 7 days in one week.

2. Some campers at this summer camp stayed only 3 weeks. How many days did they stay at camp?

3. A steamship company advertisement said, "Six glorious weeks on ship." How many days would that be?

4. Mary used the multiplying twice check for 8×7=56. How did she get the 3 and 4 shown in color in her work?

MARY

$$\begin{array}{r}7\\ \times 8\\ \hline \end{array} = \overbrace{\begin{array}{r}3\\ \times 8\\ \hline 24\end{array} \quad + \quad \begin{array}{r}4\\ \times 8\\ \hline 32\end{array}} = 56$$

Think the answer to these multiplication questions. Then check your products by multiplying twice.

5. $\begin{array}{r}7\\ \times 5\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 4\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 9\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 6\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 3\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 7\\ \hline\end{array}$

6. Make a list of the 7's facts in multiplication. You should have 9 such facts in your list.

7. Use the read-and-think way of studying given on page 58. Study the 7's facts in multiplication.

8. Make a multiplication table for the 7's.

9. Read the multiplication table of 7's carefully. Then try to say the 7's multiplication facts without looking at the table.

10. Show on a number line that 6×7=42.

Use dots. Circle tens and show the following.

11. Six 7's are equal to 4 tens and ☐ ones.

12. Nine 7's are equal to ☐ tens and ☐ ones.

Try to say the answer as soon as you glance at each number question below.

13. $\begin{array}{r}6\\ \times 3\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 2\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 9\\ \hline\end{array} \quad \begin{array}{r}6\\ \times 5\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 1\\ \hline\end{array} \quad \begin{array}{r}6\\ \times 2\\ \hline\end{array}$

14. $\begin{array}{r}7\\ \times 4\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 7\\ \hline\end{array} \quad \begin{array}{r}6\\ \times 4\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 6\\ \hline\end{array} \quad \begin{array}{r}6\\ \times 7\\ \hline\end{array} \quad \begin{array}{r}6\\ \times 9\\ \hline\end{array}$

15. $\begin{array}{r}6\\ \times 1\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 3\\ \hline\end{array} \quad \begin{array}{r}6\\ \times 8\\ \hline\end{array} \quad \begin{array}{r}6\\ \times 6\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 8\\ \hline\end{array} \quad \begin{array}{r}7\\ \times 5\\ \hline\end{array}$

Multiplying 8's

1. Jane's father brought her a tray with 32 sweet potato plants. Jane said, "I will plant them in 4 rows, and put 8 plants in a row." Did Jane figure correctly?

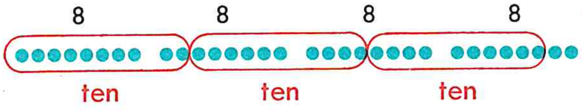
2. To answer the question about how many plants four 8's would equal, Jim explained this way:

"Four eights are twice two eights. Sixteen and sixteen equal 32."

How did Jim get sixteen?

3. Write other ways that could be used to find the product of 4 × 8.

4. Ann used dots. She circled tens to find the product of 4 × 8. Look at Ann's work. How many circles of ten did she get? How many dots were left over?



Make dot drawings to show the products for these questions.

5. $\begin{array}{r} 8 \\ \times 7 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$

6. Make a list of the multiplication facts for 8's. Study them, using some of the ways you used for studying the 6's and 7's.

Multiplying 9's

In a city park 6 teams were playing baseball. There were 9 players on each team. Alice said there were 54 players playing baseball. Alice said she found her answer in this way.

"Six 9's are how many? That would be the same as nine 6's, and that is 54."

1. Use a number line to show whether Alice's thinking was correct.

2. Alice changed the multiplication question about 9's into a question about 6's. Can all basic multiplication questions for 9's be changed into a basic multiplication question you already know?

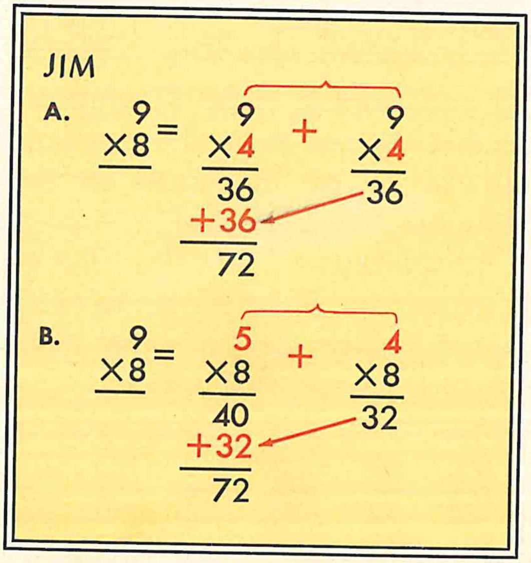
Before you answer, try changing each question for 9's in the way shown below.

$1 \times 9 = \boxed{?}$ $9 \times 1 = \boxed{?}$

$2 \times 9 = \boxed{?}$ $9 \times 2 = \boxed{?}$

3. To answer such questions as 6×9 and 4×9, why is it better to think the answer than to turn the question around?

4. Jim wanted to be sure that he answered the number question 8×9 correctly. He used two ways of multiplying twice to find the product. Look at Jim's work. How are the two ways different? How are they alike?



A.

$$\begin{array}{r}9\\ \times 8\\ \hline\end{array} = \overbrace{\begin{array}{r}9\\ \times 4\\ \hline 36\\ +36\\ \hline 72\end{array} \quad + \quad \begin{array}{r}9\\ \times 4\\ \hline 36\end{array}}$$

B.

$$\begin{array}{r}9\\ \times 8\\ \hline\end{array} = \overbrace{\begin{array}{r}5\\ \times 8\\ \hline 40\\ +32\\ \hline 72\end{array} \quad + \quad \begin{array}{r}4\\ \times 8\\ \hline 32\end{array}}$$

5. Find the answer to each of these basic multiplication questions for 9's. If you cannot think the answer, add, or multiply twice.

$\begin{array}{r}9\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 4\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 6\\ \hline\end{array}$

$\begin{array}{r}9\\ \times 3\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 5\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 2\\ \hline\end{array}$

6. Study the basic multiplication facts for 9's. Here are two ways to study.

Make a list of the basic multiplication facts for 9's. Then use the read-and-think way to study these facts. (See page 58.)

Make a study card for each of the basic multiplication facts for 9's. Study the cards as Jack did on page 60.

7. Make a table for the 9's in multiplication. Cover your table. Try to say the facts as given in the table.

Mixed Practice

Watch the signs. Write answers on folded paper.

1. $\begin{array}{r}957\\ -365\\ \hline\end{array}$ $\begin{array}{r}658\\ +79\\ \hline\end{array}$ $\begin{array}{r}5400\\ -95\\ \hline\end{array}$

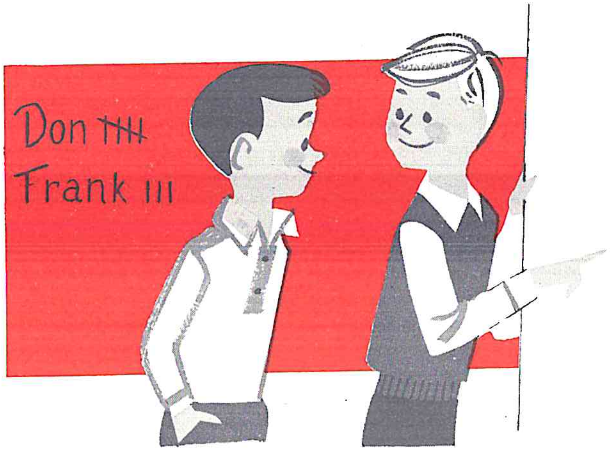
2. $\begin{array}{r}17\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}59\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}1805\\ +9007\\ \hline\end{array}$ $\begin{array}{r}6270\\ -6200\\ \hline\end{array}$

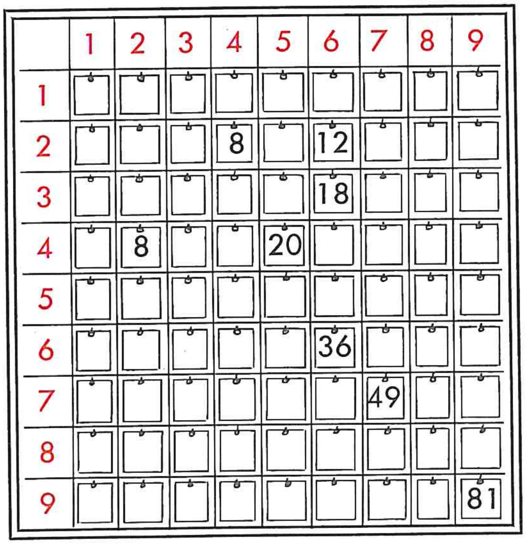
3. $\begin{array}{r}483\\ 218\\ 526\\ 974\\ +407\\ \hline\end{array}$ $\begin{array}{r}528\\ 42\\ 8\\ 316\\ +75\\ \hline\end{array}$ $\begin{array}{r}34\\ 58\\ 63\\ 29\\ +47\\ \hline\end{array}$ $\begin{array}{r}137\\ 5\\ 8\\ 93\\ +4\\ \hline\end{array}$

4. $\begin{array}{r}24\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}5429\\ -14\\ \hline\end{array}$ $\begin{array}{r}5176\\ +382\\ \hline\end{array}$

5. $\begin{array}{r}26\\ \times 4\\ \hline\end{array}$ $\begin{array}{r}48\\ \times 3\\ \hline\end{array}$ $\begin{array}{r}54\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}36\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}27\\ \times 5\\ \hline\end{array}$

A Multiplication Board





	1	2	3	4	5	6	7	8	9
1									
2				8		12			
3						18			
4		8			20				
5									
6						36			
7							49		
8									
9									81

Don and Frank played a game with the multiplication board shown in the picture. Each card on the board has a product written on one side. The products in the first row are for 1's. The products in the second row are for 2's, and so on.

When the game began, all the cards were turned so that no products showed. Don and Frank took turns.

Don pointed to a card. Frank got one tally mark if he gave the right product. Then he turned the card over.

1. What is the score so far?

2. There are two ways to figure out the product on each card. What are the two ways?

3. Use lined paper. Draw lines up and down to make 81 squares. In the squares write the products that go on all the cards on the multiplication board.

▶ Cover the products below with folded paper. Try to write each product. Check your products.

4.	3	7	4	2	7	6
	×8	×5	×9	×7	×7	×4
	24	35	36	14	49	24

5.	9	8	4	8	6	5
	×3	×2	×7	×8	×3	×8
	27	16	28	64	18	40

6.	9	6	3	2	9	4
	×5	×7	×6	×5	×7	×6
	45	42	18	10	63	24

7.	8	5	4	9	7	8
	×7	×6	×8	×6	×4	×3
	56	30	32	54	28	24

Reviewing Basic Multiplication Facts

Answer each multiplication question. Check your answer by multiplying twice.

1. How many are six 8's?
2. Four 7's equal what number?
3. Nine 5's equal what number?
4. Three 8's equal what number?
5. How many are five 7's?
6. How many are eight 4's?
7. How many are three 9's?
8. What is 6 times 7?
9. What is 4 times 9?
10. Seven 8's are how many?

Answer each multiplication question. Check your answer using the number line. (Page 68)

11. How many are six 5's?
12. Six 7's equal what number?

Use dots. Circle tens and show the answers to examples 13 and 14. (Page 68)

13. Four 9's are equal to ☐ tens and ☐ ones.
14. Eight 5's are equal to ☐ tens and ☐ ones.

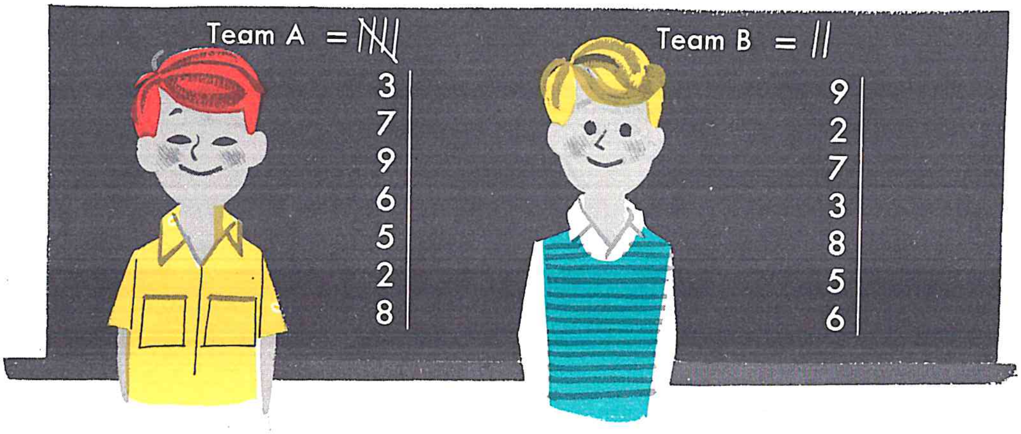
Answer each multiplication question. Check your answer by adding.

15. Seven 5's equal what number?
16. How many are four 6's?
17. Nine 2's equal what number?
18. Seven 3's equal what number?

See if you can give the answer to each of these multiplication questions as soon as you read it.

19.	8 ×7	6 ×6	7 ×5	9 ×7	7 ×4
20.	9 ×3	6 ×9	6 ×2	9 ×4	8 ×1
21.	7 ×7	8 ×3	6 ×7	9 ×5	9 ×2
22.	6 ×8	8 ×5	7 ×8	6 ×3	9 ×9
23.	7 ×7	9 ×8	8 ×4	6 ×5	9 ×6
24.	7 ×2	6 ×4	7 ×9	8 ×6	9 ×1
25.	8 ×2	7 ×3	7 ×6	8 ×2	8 ×9

26. Study the facts for the questions you could not answer in rows 19-25. Use the read-and-think way of studying.



A Multiplication Contest

These boys are in a multiplication contest. When the teacher says a number such as 7, each boy turns to the board and tries to write the product of 7 and each number that is already on the board.

When all products are written, each boy turns his back to the board. The one who turns first and has all the products correct is the winner. His team gets a tally mark. Then two other team members come to the board.

1. If the teacher said 6, what products would the boy at the left write?

2. What products would the other boy write if the teacher said 6?

3. If the teacher said 9, what products should each boy write?

4. If the teacher said 7, what products should each boy write?

You may want to have a multiplication contest in your class. Here are four sets of numbers on which you can practice.

2	8	3	8
9	6	8	1
7	3	4	2
6	4	7	9
5	2	2	4
4	5	9	7
8	9	1	6
3	7	6	5

5. Think of the product of 4 and each number in the first set of numbers.

6. Think of the product of 7 and each number in the second set of numbers.

Multiplying 2- and 3-Figure Numbers

Copy. Find the product for each example.

1.	$\begin{array}{r}31\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}23\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}41\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}36\\ \times 4\\ \hline\end{array}$
2.	$\begin{array}{r}60\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}32\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}62\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}82\\ \times 4\\ \hline\end{array}$
3.	$\begin{array}{r}57\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}43\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}16\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}27\\ \times 8\\ \hline\end{array}$
4.	$\begin{array}{r}80\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}49\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}67\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}48\\ \times 4\\ \hline\end{array}$
5.	$\begin{array}{r}20\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}65\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}57\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}54\\ \times 9\\ \hline\end{array}$

Joan checked her product for the first example in row 1 in this way.

JOAN

$$\begin{array}{r}31\\ \times 9\\ \hline\end{array} = \overbrace{\begin{array}{r}31\\ \times 5\\ \hline 155\\ +124\\ \hline 279\end{array} + \begin{array}{r}31\\ \times 4\\ \hline 124\\ \\ \\ \end{array}}$$

6. Check the products for the last three examples in row 1, using Joan's way of checking.

7. Check the products for the examples in row 2 by adding.

8. Study the multiplication examples that Tom and Ann wrote.

TOM $\begin{array}{r}240\\ \times 8\\ \hline 1920\end{array}$ ANN $\begin{array}{r}486\\ \times 7\\ \hline 3402\end{array}$

9. How did Tom get the 2 that he wrote in tens place in his product? In his example, 8×2 means 8×2 hundreds, or 16 hundreds. Why did he show 19 hundreds in his product?

10. How did Ann get the 0 she wrote in her product? Ann had 60 tens to carry to hundreds place. How many hundreds did the 60 tens equal? In her example, 7×4 means 7×4 hundreds. Why did she show 34 hundreds in her product?

Copy. Find the products.

11.	$\begin{array}{r}210\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}452\\ \times 3\\ \hline\end{array}$	$\begin{array}{r}564\\ \times 2\\ \hline\end{array}$	$\begin{array}{r}459\\ \times 4\\ \hline\end{array}$
12.	$\begin{array}{r}609\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}726\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}841\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}638\\ \times 8\\ \hline\end{array}$
13.	$\begin{array}{r}450\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}304\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}678\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}785\\ \times 9\\ \hline\end{array}$
14.	$\begin{array}{r}397\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}807\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}493\\ \times 9\\ \hline\end{array}$	$\begin{array}{r}816\\ \times 8\\ \hline\end{array}$

Saying and Writing the Products

Say the answers.

1. How many are seven 6's?

2. Eight 9's are equal to what number?

3. How many are six 9's?

4. Seven 8's equal what number?

5. How many are four 8's?

6. What is eight times zero?

7. What is one multiplied by 7?

8. Nine 7's equal what number?

Write the answers on folded paper.

9.	4	6	9	8	3
	×7	×5	×7	×9	×8
10.	7	8	6	9	7
	×7	×5	×9	×8	×5
11.	8	7	4	8	6
	×8	×4	×8	×6	×7
12.	8	5	7	9	6
	×7	×6	×9	×6	×4
13.	5	7	8	7	4
	×7	×8	×2	×2	×9
14.	5	4	7	8	6
	×8	×6	×6	×4	×8
15.	5	6	9	9	9
	×9	×6	×3	×4	×5

Copy. Write the products.

16.	28	42	59	37	40
	×6	×9	×8	×9	×6
17.	85	96	47	64	78
	×7	×8	×5	×9	×6
18.	42	36	51	46	53
	×7	×3	×4	×2	×5

19.	548	375	289	964
	×7	×9	×6	×8
20.	354	739	842	614
	×4	×9	×7	×8

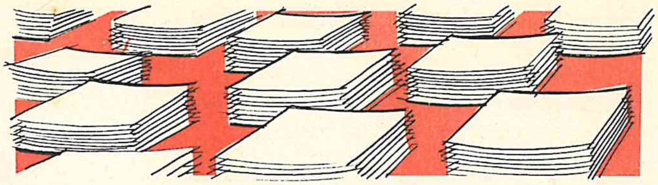
Do You Know the Answer?

1. Tom could not remember how many six 6's are. He knew that five 6's equal 30. Explain how he could find the number that six 6's equal.

2. Mary knew that five 8's equal 40. She wanted to find what number seven 8's equal. She thought, "Two 8's equal 16. Five 8's equal 40." What can Mary do to find the number that seven 8's equal?

3. When Bill forgot how many nine 7's equal, he thought, "Ten 7's equal 70." What else must Bill think to find the number nine 7's equal?

Addition, Subtraction, and Multiplication Problems



1. The teacher opened a 500-sheet package of paper. She counted out 8 sheets for each of the 35 pupils in the class. How many sheets did she count?

2. Alice read 3 books one week. The first book had 248 pages. The second had 192 pages. The third had 200 pages. How many pages did she read that week?

3. Mrs. Smith bought 3 pounds of meat. The price was $1.46. She gave the clerk $2. How much money should Mrs. Smith get back from the clerk?

4. Sue feeds her cat 5 small cans of cat food in one week. How many cans will she buy if she wants enough cans to feed the cat for 4 weeks?

5. Jerry has 6 rabbits in each rabbit pen. How many rabbits does he have in 7 such pens?

6. In a dart game Jane made a score of 24 points. Bob scored 3 times as many points as Jane did. What was Bob's score?

7. There were 100 paper napkins in the package when it was full. There are 21 napkins left in the package. How many of the napkins are gone?

8. Gary said, "There are 7 days in a full week. It is exactly 9 weeks until my birthday." How many days is it until Gary's birthday?

9. Ann's mother bought 9 cards of buttons. There were 8 buttons on each card. How many buttons did her mother buy?

10. Ruth bought 4 boxes of cookies. There were 36 cookies in each box. Ruth said that she had bought 144 cookies. Was she right?

11. Don collects stamps. Last week he had 247 stamps. This week he has 300 stamps. How many stamps did he collect this week?

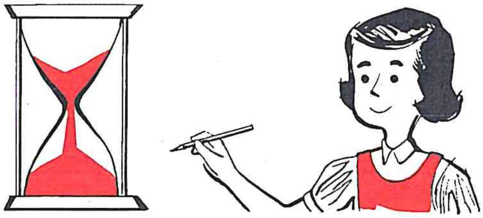
12. In the school auditorium there are 68 rows of seats. There are 19 seats in each row. How many seats are there in all?

13. Betty needs 378 squares of cloth to make a quilt cover. She cut 125 squares from 3 pieces of cloth that her mother gave her. How many more squares must she cut?

Measuring Improvement—Test 3

The teacher will tell you when to begin and when to stop. For rows 1 and 2 write your answers on folded paper. Copy the other rows. Be sure to watch the signs.

1.	9 ×4	7 ×6	8 ×9	4 ×8	6 ×7
2.	1 ×6	6 ×8	8 ×7	9 ×6	7 ×7
3.	36 +58	59 −19	84 −81	89 ×3	
4.	61 −38	86 +95	78 −40	67 ×8	
5.	74 ×9	72 ×6	4705 −1699		



6.	458 ×7	527 ×9	5890 +928
7.	143 ×6	639 ×5	4893 +1372
8.	612 −98	574 ×8	9472 −76
9.	6000 −5994	8115 +8	

On your paper, write the number of right answers that you have, the number of minutes that you worked, and the date.

Call this paper "Improvement Test 3." Keep this test in your arithmetic notebook.

Things to Help You Improve

1. Turn to page 326. Write the products on folded paper. Use page 325 to check your answers.

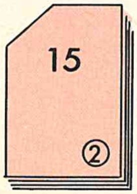
2. Make basic multiplication fact cards for 6's, 7's, 8's, and 9's.

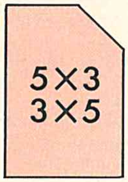
3. Put all your basic multiplication fact cards together. Use these cards as Jack did on page 60.

Another very good multiplication study card is the basic product card. On one side of a card, a basic product and a small number are written.

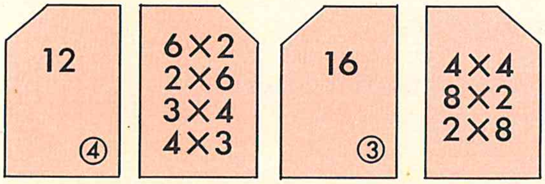
The small number tells how many multiplication questions have that product for an answer.

For example, the card at the top of the stack shown below has a small 2 on it. On the other side of the card are these two multiplication questions: 5×3 and 3×5.

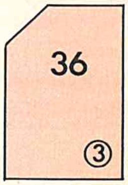


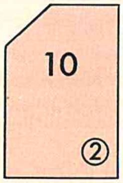


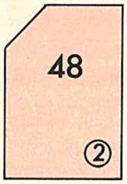
Below are the basic product side and the question side of two cards.



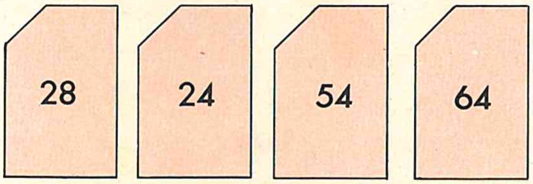
4. Write the basic multiplication questions that should be on the other side of the cards below.







5. In making the following basic product cards, what small number should you write on each card?



6. To make a set of basic product cards, you need all products and all basic multiplication questions. You will find it helpful to do this:

- Write products larger than 10.
- Write the basic multiplication questions for each product. The first two are given here.

12 = 6×2
2×6
3×4
4×3

14 = 2×7
7×2

Make a set of basic product cards. Use them for reviewing or for learning basic multiplication facts.

Study your cards. Try to give all the basic multiplication questions for the product shown on the card.

▶ Copy. Find the products.

7. $\begin{array}{r}386\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}450\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}595\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}741\\ \times 6\\ \hline\end{array}$

8. $\begin{array}{r}448\\ \times 5\\ \hline\end{array}$ $\begin{array}{r}287\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}712\\ \times 2\\ \hline\end{array}$ $\begin{array}{r}485\\ \times 4\\ \hline\end{array}$

9. $\begin{array}{r}693\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}500\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}383\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}736\\ \times 6\\ \hline\end{array}$

10. $\begin{array}{r}756\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}914\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}370\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}496\\ \times 9\\ \hline\end{array}$

11. $\begin{array}{r}253\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}194\\ \times 3\\ \hline\end{array}$ $\begin{array}{r}895\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}559\\ \times 9\\ \hline\end{array}$

MULTIPLICATION TABLES FOR 6'S, 7'S, 8'S, AND 9'S

TABLE FOR 6'S	TABLE FOR 7'S	TABLE FOR 8'S	TABLE FOR 9'S
1×6 = 6	1×7 = 7	1×8 = 8	1×9 = 9
2×6 = 12	2×7 = 14	2×8 = 16	2×9 = 18
3×6 = 18	3×7 = 21	3×8 = 24	3×9 = 27
4×6 = 24	4×7 = 28	4×8 = 32	4×9 = 36
5×6 = 30	5×7 = 35	5×8 = 40	5×9 = 45
6×6 = 36	6×7 = 42	6×8 = 48	6×9 = 54
7×6 = 42	7×7 = 49	7×8 = 56	7×9 = 63
8×6 = 48	8×7 = 56	8×8 = 64	8×9 = 72
9×6 = 54	9×7 = 63	9×8 = 72	9×9 = 81

Multiplication Tables for 6's, 7's, 8's, and 9's

Saying the multiplication tables can help you in learning the basic multiplication facts well.

1. Review the tables for 2's, 3's, 4's, and 5's. These tables are given on page 66.

2. Read the table for 6's. Then cover the products. See if you can give the products in order. Do the same for the 7's, 8's, and 9's.

3. Read the table for 9's. Then cover the table. Try to say the facts for 9's in order. If you find you cannot say them, study the table again.

4. Can you count quickly by 6's, 7's, 8's, and 9's? If you cannot, cover the products in these tables and practice giving the products in order.

▶ Copy. Find the products. Check by going over your work.

5.	742 ×8	867 ×6	659 ×9	865 ×7
6.	963 ×6	289 ×9	517 ×8	594 ×7
7.	632 ×6	648 ×7	816 ×8	375 ×9

Making Other Multiplication Tables

Jim found these two multiplication tables given in his older sister's arithmetic book.

TABLE FOR 6'S	TABLE FOR 6
1×6= 6	6×1= 6
2×6=12	6×2=12
3×6=18	6×3=18
4×6=24	6×4=24
5×6=30	6×5=30
6×6=36	6×6=36
7×6=42	6×7=42
8×6=48	6×8=48
9×6=54	6×9=54

1. Which table above has 6 as a multiplier? A and B below will help you if you are not sure.

A.

$$\overset{\text{multiplier}}{\downarrow}\hspace{-1em}6 \times \overset{\text{multiplicand}}{\downarrow}\hspace{-1em}3 = \overset{\text{product}}{\downarrow}\hspace{-1em}18$$

B.

$$\begin{array}{rl} 3 & \text{multiplicand} \\ \times 6 & \text{multiplier} \\ \hline 18 & \text{product} \end{array}$$

2. Which table above tells you what number equals eight 6's?

3. On the board Tom wrote the following addition question.

TOM

4 + 4 + 4 + 4 + 4 + 4 = $\boxed{?}$

How would Tom write his example if he wrote it as a multiplication number question?

4. Write each of these multiplication questions as addition questions: 5×6 and 6×5.

5. Write the multiplication table for 7. How will this table differ from the table for 7's on page 80? How will the two tables be alike?

6. Write the multiplication table for 8. For 9.

7. Sue wrote 9 words in each column. How many did she write in 5 columns? Sue found her answer by adding.

SUE 9 + 9 + 9 + 9 + 9 = 45

Write the multiplication fact that Sue could have used to answer the question in her problem.

Write the multiplication fact that you would use to answer the question in each of these problems.

8. There are 9 books on each shelf. How many books are there on 5 shelves?

9. Bill pastes 5 stamps in each row in his stamp book. How many stamps does he need to make 6 rows?

How Well Have You Learned?

Answering these questions will help you to find out how well you learned things studied in this unit.

DON

$$\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$$

1. Don wrote this multiplication question. Which way should his question be read, "Nine 2's equal how many?" or "Two 9's equal how many?" The following two multiplication questions will help you to answer.

$$\begin{array}{r} 12 \\ \times 9 \\ \hline \end{array} \qquad \begin{array}{r} 24 \\ \times 9 \\ \hline \end{array}$$

2. What are the two best ways of finding the answer to a multiplication question that you cannot answer? Use 9×7 to show your two ways.

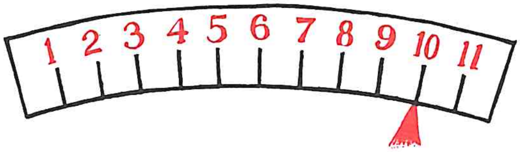
3. Why is it better to learn the answer to "How many are four 8's?" than to change the question to "How many are eight 4's?"

4. How many dots do you have to draw to show that four 3's = 12?

5. What is the rule to use when the number 1 is multiplied?

6. What is the multiplication rule for zero?

7. Ann found the answer to the multiplication question 7×48 = $\boxed{?}$. She used the words tens and ones in doing her multiplication. In her example how did she get the figures 33 in the final product?



ANN 4 tens 8 ones

×7

28 tens 56 ones = 336

8. What makes multiplying twice a good check of the product? Use 7×6 = 42 to show your answer.

9. Bob wants to show that six 7's equal four 10's and two 1's. Is marking on the number line a better way than using dots and circling 10's?

10. Tom and Jack wanted to check the product to 8×9 = 72. Tom added eight 9's. Jack multiplied twice, using 5×9 and 3×9. Which boy used the better way? Why?

11. When Gary multiplied, he carried 4 hundreds to hundreds place. Where did he get the four hundreds?

GARY

$$\begin{array}{r} 350 \\ \times 8 \\ \hline 2800 \end{array}$$

Helping Yourself

You can make your work stronger by doing the things asked on this page. When you do not know, or when you are not sure, the pages given in color will help you.

Betty, Sue, and Don wrote these multiplication examples on the board.

BETTY	SUE	DON
$\begin{array}{r}56\\ \times 9\\ \hline 504\end{array}$	$\begin{array}{r}37\\ \times 3\\ \hline 111\end{array}$	$\begin{array}{r}283\\ \times 7\\ \hline 1981\end{array}$

1. Which child's example has the largest product? (57)

2. Which child's example has the smallest multiplicand? (57)

3. Which of the three examples has no tens in tens place in the product? (62)

4. Which children carried 2 tens to tens place in multiplying? (62)

5. In multiplying, which child thought, "Three 7's equal what number?" (80)

6. Did any of these children carry to tens and to hundreds place in multiplying? (75)

7. Betty said she was not sure that her product was correct. Check her product by multiplying twice. (75)

See how fast you can write on folded paper the products for the examples below. Use page 325 to check your answers.

8. $\begin{array}{r}9\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}7\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}6\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}6\\ \times 8\\ \hline\end{array}$

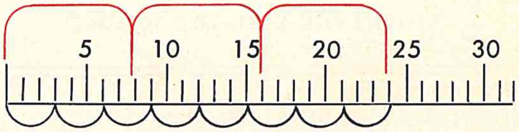
9. $\begin{array}{r}7\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}8\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}6\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}7\\ \times 5\\ \hline\end{array}$

10. $\begin{array}{r}8\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}6\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}9\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}4\\ \times 8\\ \hline\end{array}$ $\begin{array}{r}8\\ \times 7\\ \hline\end{array}$

11. $\begin{array}{r}7\\ \times 4\\ \hline\end{array}$ $\begin{array}{r}8\\ \times 4\\ \hline\end{array}$ $\begin{array}{r}7\\ \times 6\\ \hline\end{array}$ $\begin{array}{r}4\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}8\\ \times 9\\ \hline\end{array}$

Page 58 tells you how to study any facts you did not know.

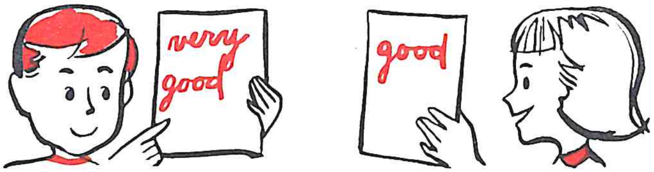
12. Two basic multiplication facts are shown on this number line. Write the fact shown by the colored line. Label the fact A. Write the fact shown by the black line. Label this fact B. (56)



Copy. Find the products. (75)

13. $\begin{array}{r}49\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}597\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}745\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}698\\ \times 9\\ \hline\end{array}$

How Well Are You Doing?



Doing these exercises will help you to find out if you know the things you studied in this unit.

1. Write the question, "How many are three 4's?" using only numbers.

2. What are two good ways to study a multiplication fact? Use 6×7=42 to show your ways of studying.

3. Show on a number line the multiplication fact 4×9=36.

4. Draw dots and circle them by tens. Show nine 6's changed to five tens and four 1's.

5. Write the multiplication questions that should be on the question side of a basic product card for 64. For 18. For 24. For 36.

6. Show how you can check the product for 6×8 by multiplying twice.

7. Finish Bill's multiplication.

BILL 5 tens 8 ones
×4
______
ones

8. Write the facts in the multiplication table for the 4's. For the 7's.

9. Make a dot drawing to use in finding the multiplication facts for 6's.

10. Write two sets of numbers to use in a multiplication race.

Write the addition, subtraction, or multiplication fact that you would use in finding the answer to each of the following problems.

11. Carl delivers 96 newspapers each evening. How many will he deliver in 6 evenings?

12. One storybook had 198 pages in it. Another had 207 pages. If Bob takes the shorter storybook, he will have how many fewer pages to read?

13. There were 10 bunches of carrots with 8 carrots in each bunch. Mrs. Smith bought 3 of the bunches for 25¢. How many carrots did she buy?

14. Jerry saved 53 coupons toward getting a fishing rod. He needs 47 more coupons before he can get the fishing rod free. How many coupons must Jerry have to get the fishing rod?

UNIT FOUR

Dividing a Number

Sue and her mother have just come from the market. They are putting some of the things they bought into the refrigerator. Sue asked, "How long will the 24 eggs we bought today last us?"

"We use four eggs a day. You can figure it out," her mother answered.

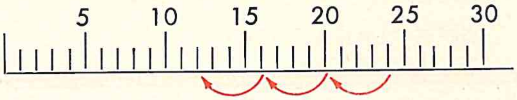
1. Sue needed the answer to what number question?

2. Sue thought the answer was 6. To be sure, she began to subtract 4's. Here are the first figures she wrote. Finish her work. The finished subtraction shows that 24 is equal to how many 4's?

SUE

$$\begin{array}{r} 24 \\ -4 \\ \hline 20 \\ -4 \\ \hline \end{array}$$

3. Jim began to show how to divide 24 into 4's by using the number line. When his drawing is finished, how many 4's will it show?



4. Use a number line to divide 12 into 4's.

5. Use a number line to show how many 6's equal 18.

6. Divide the number 15 into groups of 3 by subtracting.

7. How many 2's = 16?

8. How many 3's = 24?

9. How many 5's = 15?

■ **The number way to write a division question like, "How many 2's equal 10?" is $2\overline{)10}$.**

10. Write in the number way the division questions in examples 7, 8, and 9 above.

$$\begin{array}{r} 6 \\ 2\overline{)12} \\ \underline{12} \end{array} \qquad 3\overline{)18} \qquad 7\overline{)21} \qquad 4\overline{)16} \qquad 3\overline{)21}$$

Checking Answers to Division Questions

Frank told Betty that you can always check your answer to a division question by multiplying. For the question, "How many 2's equal 12?" he said the answer is 6.

"To check, multiply 6 and 2. The product is 12, or the same number with which you began," Frank explained.

Betty then wrote this.

BETTY

$$\begin{array}{r} 6 \\ 2\overline{)12} \\ \underline{-12} \end{array}$$

CHECK

$$\begin{array}{r} 2 \\ \underline{\times 6} \\ 12 \end{array}$$

1. Write what Betty would have written if the division question had been, "How many 3's equal 18?"

2. Read the last three division questions shown on the chalkboard above. Try to answer each of them. Then check your answer the way Frank and Betty did.

3. Frank got the wrong answer to $3\overline{)21}$. What two ways could he use to find the right answer?

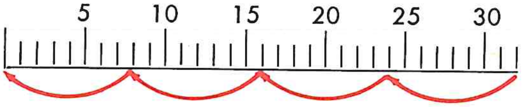
4. Use drawings to show that you have the right answers to questions 5 and 6.

5. Mrs. Smith had 24 roses. She decided to use 3 roses to decorate each table. How many tables could she decorate?

6. Jack carried 4 chairs on each trip. How many trips did he make to carry 28 chairs?

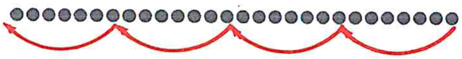
7. Joan drew this number line. Write the division question she was trying to answer.

JOAN



8. Bill made this dot drawing. Write the division question that his drawing shows.

BILL



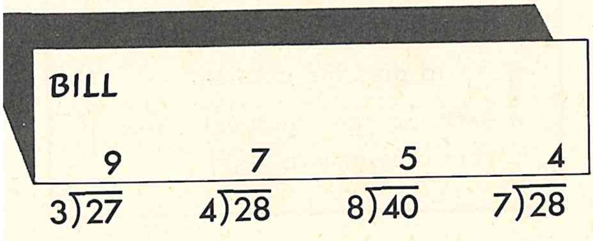
9. Gary had 48 carrots. He tied them in bunches of 6 carrots each. How many bunches did he make? Check your answer by subtracting.

Answering Division Questions

Here are some easy division questions. See if you can answer all the questions in rows 1-9. You should give the answer to each question as soon as you glance at it.

1. $2\overline{)10}$ $3\overline{)18}$ $3\overline{)9}$ $2\overline{)8}$
2. $2\overline{)6}$ $5\overline{)15}$ $4\overline{)24}$ $5\overline{)10}$
3. $3\overline{)6}$ $3\overline{)24}$ $5\overline{)45}$ $4\overline{)20}$
4. $4\overline{)32}$ $5\overline{)40}$ $4\overline{)28}$ $2\overline{)4}$
5. $3\overline{)15}$ $6\overline{)24}$ $4\overline{)12}$ $6\overline{)18}$
6. $8\overline{)24}$ $6\overline{)30}$ $6\overline{)12}$ $8\overline{)16}$
7. $4\overline{)16}$ $2\overline{)14}$ $2\overline{)12}$ $7\overline{)21}$
8. $2\overline{)16}$ $2\overline{)2}$ $3\overline{)12}$ $4\overline{)8}$
9. $5\overline{)25}$ $3\overline{)21}$ $7\overline{)14}$ $5\overline{)20}$

10. Use folded paper. Write the answers to the division questions in rows 1-9. Place the fold of your paper above the questions.



11. Use a number line or subtraction to find the answers to any division questions you did not know in rows 1-9.

No Pencils, Please!

Must you add, subtract, multiply, or divide to answer these number questions?

1. Fifteen is how many more than 9?
2. Seven and 9 more are how many?
3. How many are seven 5's?
4. How many are four 7's?
5. How many 8's equal 24?
6. How many are six 3's?
7. Two 9's are how many?
8. The difference between 16 and 7 is how many?
9. Seven 6's are how many?
10. How many 7's equal 21?
11. How many 5's equal 30?
12. How much is 7 and 9?

For each number question from 1-12, write a number fact that will answer the question.

Basic Division Facts and Multiplication Check

Use folded paper. Cover the answers in row 1. Try to write the answers quickly.

Move your paper. Check your answers. Do this for each row of division questions.

1. $\begin{array}{r} 4 \\ 2\overline{)8} \\ \underline{8} \end{array}$ $\begin{array}{r} 3 \\ 4\overline{)12} \\ \underline{12} \end{array}$ $\begin{array}{r} 2 \\ 3\overline{)6} \\ \underline{6} \end{array}$ $\begin{array}{r} 6 \\ 4\overline{)24} \\ \underline{24} \end{array}$

2. $\begin{array}{r} 2 \\ 6\overline{)12} \\ \underline{12} \end{array}$ $\begin{array}{r} 3 \\ 7\overline{)21} \\ \underline{21} \end{array}$ $\begin{array}{r} 3 \\ 3\overline{)9} \\ \underline{9} \end{array}$ $\begin{array}{r} 2 \\ 4\overline{)8} \\ \underline{8} \end{array}$

3. $\begin{array}{r} 3 \\ 2\overline{)6} \\ \underline{6} \end{array}$ $\begin{array}{r} 2 \\ 2\overline{)4} \\ \underline{4} \end{array}$ $\begin{array}{r} 5 \\ 2\overline{)10} \\ \underline{10} \end{array}$ $\begin{array}{r} 4 \\ 3\overline{)12} \\ \underline{12} \end{array}$

4. $\begin{array}{r} 2 \\ 7\overline{)14} \\ \underline{14} \end{array}$ $\begin{array}{r} 4 \\ 4\overline{)16} \\ \underline{16} \end{array}$ $\begin{array}{r} 6 \\ 2\overline{)12} \\ \underline{12} \end{array}$ $\begin{array}{r} 3 \\ 8\overline{)24} \\ \underline{24} \end{array}$

5. $\begin{array}{r} 2 \\ 8\overline{)16} \\ \underline{16} \end{array}$ $\begin{array}{r} 7 \\ 3\overline{)21} \\ \underline{21} \end{array}$ $\begin{array}{r} 2 \\ 8\overline{)16} \\ \underline{16} \end{array}$ $\begin{array}{r} 5 \\ 3\overline{)15} \\ \underline{15} \end{array}$

6. $\begin{array}{r} 4 \\ 6\overline{)24} \\ \underline{24} \end{array}$ $\begin{array}{r} 3 \\ 6\overline{)18} \\ \underline{18} \end{array}$ $\begin{array}{r} 5 \\ 5\overline{)25} \\ \underline{25} \end{array}$ $\begin{array}{r} 8 \\ 4\overline{)32} \\ \underline{32} \end{array}$

7. $\begin{array}{r} 7 \\ 4\overline{)28} \\ \underline{28} \end{array}$ $\begin{array}{r} 2 \\ 5\overline{)10} \\ \underline{10} \end{array}$ $\begin{array}{r} 8 \\ 3\overline{)24} \\ \underline{24} \end{array}$ $\begin{array}{r} 5 \\ 4\overline{)20} \\ \underline{20} \end{array}$

8. $\begin{array}{r} 6 \\ 3\overline{)18} \\ \underline{18} \end{array}$ $\begin{array}{r} 8 \\ 5\overline{)40} \\ \underline{40} \end{array}$ $\begin{array}{r} 4 \\ 8\overline{)32} \\ \underline{32} \end{array}$ $\begin{array}{r} 7 \\ 2\overline{)14} \\ \underline{14} \end{array}$

If you do not know the answers to division questions well, study the division facts you find difficult.

■ **A division question with its answer is called a division fact.**

Here are some good ways to study division facts.

How to Study Division Facts

- Read each fact carefully. For the first one say, "How many 2's equal 8? Four. Four times 2 = 8."
- Then close your eyes and think the fact.
- Next open your eyes and look at the fact. Is the fact as you thought it? If not, read the fact again.
- Close your eyes. Think the fact. Then look again. Do this a number of times.

- Cover the quotient part of each division fact.
- Try to give the quotient.
- Uncover the quotient. See if your answer was right.

In the second study suggestion the answer to the division question is called the quotient. You will often want to refer to the terms, or parts, of a division fact.

$$\begin{array}{r} 5 \leftarrow \text{quotient} \\ \text{divisor} \rightarrow 9\overline{)45} \leftarrow \text{dividend} \end{array}$$

Nancy wrote these division facts on the board. Can you answer the questions she asked about these facts? Here are Nancy's questions.

NANCY

A. $\begin{array}{r} 9 \\ 4\overline{)36} \end{array}$ B. $\begin{array}{r} 8 \\ 5\overline{)40} \end{array}$ C. $\begin{array}{r} 3 \\ 8\overline{)24} \end{array}$

9. Which fact has 8 for the quotient? For the divisor?

10. Which fact has the smallest dividend? The smallest divisor?

11. Write a division fact that has 40 for the dividend and 8 for the divisor.

12. Write a division fact that has 36 for the dividend and 9 for the divisor.

13. Write a division fact that has 5 for the divisor and 35 for the dividend.

Division Facts from Multiplication Tables

Bill said he had discovered a way to make division facts quickly. He wrote these multiplication tables on the board.

1×2= 2	1×3= 3
2×2= 4	2×3= 6
3×2= 6	3×3= 9
4×2= 8	4×3=12
1×4= 4	1×5= 5
2×4= 8	2×5=10
3×4=12	3×5=15

"You can make a division fact from each multiplication fact," Bill said. "This is the way it is done." Look at what Bill wrote.

$$\begin{array}{rl} 3 & \text{multiplicand} \\ \times 2 & \text{multiplier} \\ \hline 6 & \text{product} \end{array} \qquad \begin{array}{r} 2 \text{ quotient} \\ \text{divisor } 3\overline{)6} \text{ dividend} \end{array}$$

1. Use Bill's way. Write the division fact that goes with each multiplication fact.

2. Make a division fact from 8×3=24.

3. Make a division fact from 9×5=45.

Some Study Helps for Multiplication and Division

1. The division facts will be very easy for you if you know the multiplication facts well. Read the multiplication facts on page 66. Then cover the tables and see if you can give the facts in each table.

2. Write the multiplication table for the 4's. Beside each multiplication fact, write the division fact that goes with the multiplication fact.

3. Write the multiplication tables for the 2's, 3's, and 5's. Beside each multiplication fact, write the division fact that goes with it.

Write answers for these questions.

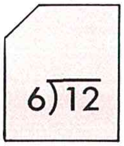
4. How many 4's = 36?
5. How many 2's = 14?
6. How many 5's = 30?
7. How many 3's = 9?
8. How many 4's = 16?
9. How many 5's = 45?
10. How many 3's = 24?

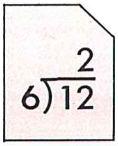
11. Show with a number line that your answers to questions 4, 5, 6, and 7 are correct.

12. Use subtraction to show that your answers for questions 8, 9, and 10 are correct.

Using Basic Division Fact Cards

Basic division fact cards like the one shown here are helpful in learning division facts.



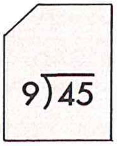


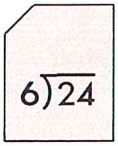
1. Use your basic division fact cards and study in this way.

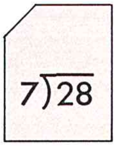
Arrange the cards so that only the question side is facing you. That means all cut-off corners are at your left.

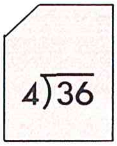
Read the question on the top card. Answer it. Turn the card over and see if you answered the question correctly. If not, read and think the fact several times. Then put the card at the back of the stack and go on with the next question.

2. Give the fact that is written on the back of each of the cards below.









Addition, Subtraction, Multiplication, and Division Problems

Read each problem carefully. Decide what number question will help you answer the question the problem asks. Then find the answer to your number question.

1. Bill's father works 8 hours a day. How many hours will he work in a week of 5 working days?

2. Joan picked 36 tomatoes from her 16 tomato plants. She wants to put 4 tomatoes into each basket for selling. How many baskets will she need?

3. Mrs. Smith bought 21 yards of material for making 3 pairs of draperies. Later she found that she needed 25 yards to make the draperies. How many more yards of material must she buy?

4. Jim had 45 airplane picture cards. He gave each boy 9 of the cards. To how many boys did he give picture cards?

5. Sue often pins her hair in pin curls. She uses 2 hairpins for each curl. How many curls can she make if she has 18 hairpins?

6. Jane baked cookies to sell at a school fair. She had 18 bags of cookies with 15 cookies in each bag. How many cookies did she bake if she put all the cookies into these bags?

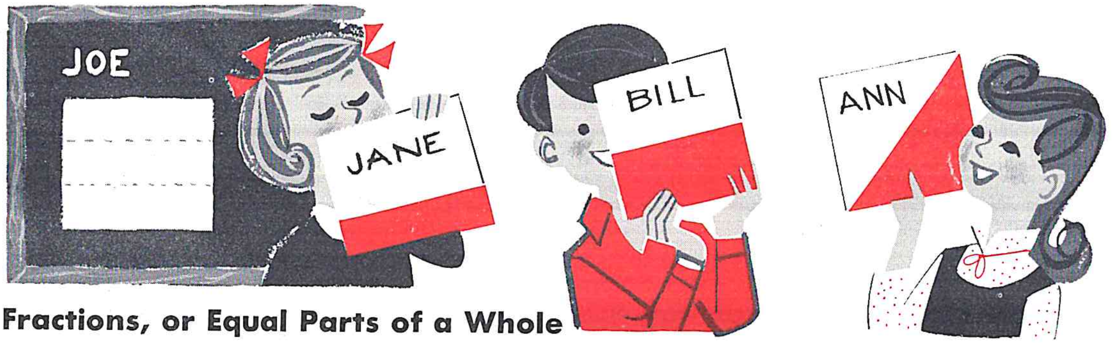
7. Tom spent all the money he earned for a box of 3 handkerchiefs and a pair of jeans. How much did he earn if the box of handkerchiefs cost $.98 and the jeans cost $3.79?

8. Gary had 20 lunch checks. He used 4 checks a day to buy his lunch. How many days did the checks last?

9. Jerry has 32 rabbits. He keeps 8 rabbits in each hutch. How many rabbit hutches does he need?

10. Jim says he gets time to read about 7 pages of his storybook each day. At that rate, how many days will Jim take to read a story that is 28 pages long?

11. In the school cafeteria, Gary saw a tray of drinking glasses. He counted 12 glasses in a row, and saw that there were 12 rows. How many glasses were there on the tray?



Fractions, or Equal Parts of a Whole

The teacher gave Jane, Bill, and Ann each a square sheet of paper. The teacher said, "Fold your paper into halves. Color one half of the paper."

1. Which of the children did what the teacher told them to do? How can you tell that their work is correct?

2. Whose paper is not folded in half? How can you tell?

🟥 **One half is written with numbers as $\frac{1}{2}$.**

3. What part of the fraction $\frac{1}{2}$ tells you how many equal parts there are in the whole?

4. Joe's picture on the chalkboard shows three equal parts in the whole. Write a fraction that means 1 of the 3 equal parts.

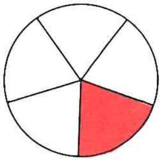
The teacher gave a piece of paper cut like a circle to several pupils. She said, "You can decide into how many equal parts you wish to make your circle and how many equal parts to color. But you must be able to give the name of one of the equal parts. Then you must give a fraction that tells how many equal parts you colored."

The children's work is shown at the bottom of the page.

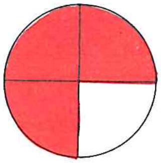
5. Sue said one of the equal parts of her circle is $\frac{1}{4}$ of the whole circle. How can you tell if she is right? Write a fraction that tells how many equal parts of the circle Sue colored.

6. Who divided the circle into fifths? Write the fraction that means one fifth.

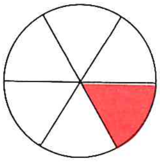
JACK



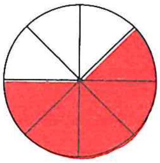
SUE



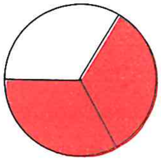
BOB



CAROL



DON



7. What is the name of one of the equal parts in Bob's circle? How can you tell?

8. Write a fraction that tells how many of the equal parts Bob did not color in his circle.

9. Carol said one of the equal parts of her circle is $\frac{1}{8}$ of the circle. How many equal parts are there in her circle?

10. Write a fraction that tells how many eighths of Carol's circle are colored.

11. Which child made the circle into the fewest parts? Is one of the equal parts in his circle larger or smaller than one of the equal parts in the other circles?

12. Don looked at all the circles. He said, "The more equal parts there are, the smaller each equal part will be." Whose circle has the most equal parts? Whose circle has the smallest equal parts? Was Don's statement correct?

13. In which of these will the size of the equal parts be the smaller:

A pie cut into $\frac{1}{4}$'s or the same pie cut into $\frac{1}{3}$'s?

A candy bar broken into five equal parts, or the same bar broken into halves?

14. See if you can write this row of fractions as someone reads them to you.

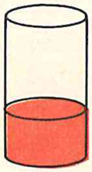
$\frac{1}{6}$ $\frac{1}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{2}{3}$ $\frac{4}{5}$

15. Draw a picture of a candy bar divided into fifths. Cross out four fifths of the bar.

■ **Numbers like $\frac{1}{2}$, $\frac{1}{4}$, $\frac{4}{5}$, $\frac{5}{8}$, and $\frac{2}{3}$ are called fractions.**

16. Why would one half of an apple be larger than one fourth of the same apple?

17. Is $\frac{1}{4}$ of a small pie the same size as $\frac{1}{4}$ of a larger pie? Draw a picture to help you find your answer.

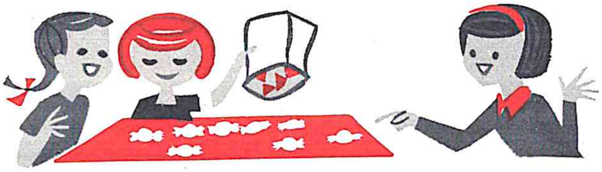


18. How full is the glass shown here? Draw a glass having straight sides like the one shown here. Color or shade your glass to show that it is $\frac{3}{4}$ full.

19. Betty baked a cake. She cut it into six equal parts. She put five of the parts on a plate. What part of the cake was on the plate?

20. Is $\frac{1}{4}$ of a small orange the same size as $\frac{1}{4}$ of a large orange?

21. Jim had a large stick of candy. He broke it into 3 equal parts. Jim ate one of the parts. What part of the stick of candy did he eat?



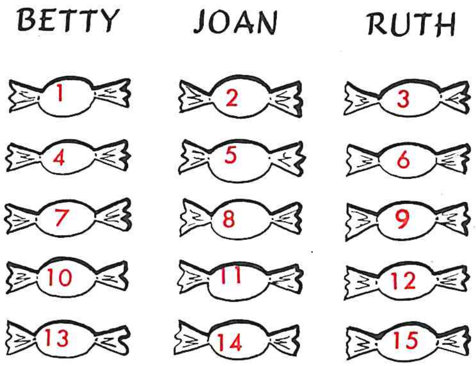
Dividing a Number of Things into Equal Amounts

At a candy hunt, 3 girls worked as a team. When the hunt was over, together the team had 15 pieces of candy. The girls wanted to divide the candy so that each girl would get the same number of pieces. What would each girl's share be?

1. Betty said, "I think you divide, but you cannot divide 15 pieces of candy by 3 girls." Is Betty's thinking correct?

2. Joan said, "There are 3 of us. That means each one gets a third. How do you find a third of 15?" Can you answer Joan's question?

3. The girls counted out the candy, a piece at a time to each girl. The drawing below shows what they did. How many pieces of candy did each girl get?



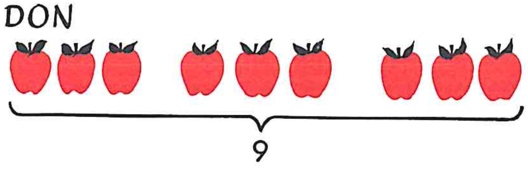
4. Four boys divided 20 marbles so that each boy got the same number. How many marbles did each boy get? Check your answer by using a counting way such as the girls used.

5. In working example 4, one girl said, "Each of the boys got a fourth of 20 marbles. You can find a fourth of any number by dividing it by 4." Is that true?

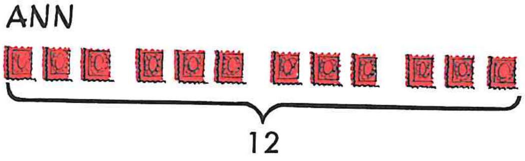
6. Find one fourth of 8 by dividing. Show with a drawing that your answer is correct.

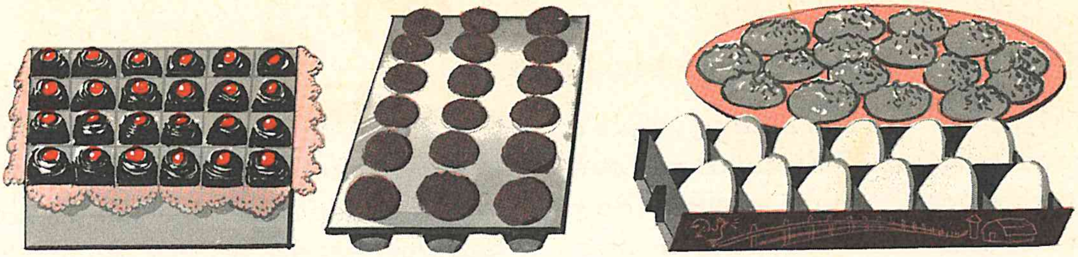
7. Find one half of 14 by dividing.

8. Don had 9 apples. Look at the picture below. He divided them into how many equal parts? Give the fraction that names each of the equal parts.



9. How many are $\frac{1}{4}$ of Ann's stamps? $\frac{1}{4}$ of $12 = \boxed{?}$.

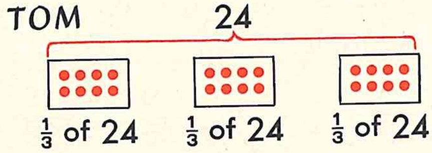




Using Division in Another Way

Ann had a box containing 24 pieces of candy. She said, "I am going to put $\frac{1}{3}$ of my candy into my lunch box." Ann then put 8 pieces of the candy into her lunch box. Find out if $\frac{1}{3}$ of $24 = 8$.

1. Tom drew dots to show $\frac{1}{3}$ of 24. What answer did he get?



2. Jack said, "To find $\frac{1}{3}$ of 24 you may divide." He wrote this.

JACK $24 \div 3 = 8$ or

$$\begin{array}{r} 8 \\ 3\overline{)24} \end{array} \text{ or}$$

$\frac{1}{3}$ of $24 = 8$

What division fact did Jack have to know to find $\frac{1}{3}$ of 24?

3. How many pieces of candy would Ann put into her lunch box if she took $\frac{1}{4}$ of the 24 pieces? Write the division fact that you use in three ways, as Jack did in his work.

4. Mary baked 18 cupcakes. She put chocolate icing on $\frac{1}{2}$ of the 18 cupcakes. How many did she ice with chocolate?

$\frac{1}{2}$ of $18 = \boxed{?}$

THINK

$18 \div 2 = \boxed{?}$

or

$$\begin{array}{r} \boxed{?} \\ 2\overline{)18} \end{array}$$

■ **To find how many in one of the equal parts of a number of things, you divide by the number of equal parts. The quotient tells how many there are in each equal part.**

▶ Copy. Write the answers. Use the pictures at the top of the page to check your answers.

5. $\frac{1}{3}$ of $18 = \boxed{?}$ $\frac{1}{2}$ of $12 = \boxed{?}$
6. $\frac{1}{4}$ of $16 = \boxed{?}$ $\frac{1}{6}$ of $18 = \boxed{?}$
7. $\frac{1}{8}$ of $16 = \boxed{?}$ $\frac{1}{9}$ of $18 = \boxed{?}$
8. $\frac{1}{3}$ of $12 = \boxed{?}$ $\frac{1}{6}$ of $12 = \boxed{?}$
9. $\frac{1}{6}$ of $24 = \boxed{?}$ $\frac{1}{4}$ of $12 = \boxed{?}$
10. $\frac{1}{2}$ of $16 = \boxed{?}$ $\frac{1}{8}$ of $24 = \boxed{?}$

Finding How Many in One Equal Part

1. There are 20 children in Sue's reading class. The children were working in 5 equal groups. How many children were there in each group?

2. Bob made 6 equal stacks from 30 pieces of paper. How many pieces of paper did he put in each stack?

3. Jim arranged 27 pennies in 3 equal rows. How many pennies did he put in each row?

4. Bill has 15 spelling words to write in his notebook. He wrote the words in 3 equal columns. How many words did he write in each column?

5. Gary had 40 spelling words to write on a sheet of paper. He said, "I can write the 40 words in 5 equal columns. Then I will have 8 words in each column." Write the division fact that Gary used.

6. Gary thought again. He said, "I can write the 40 words in 8 equal columns. Then I will have 5 words in a column." Write the division fact that Gary used this time.

Related Pairs of Division Facts

Gary said, "When I wrote the division facts for problems 5 and 6, I discovered that the two facts made a pair. The dividend in both facts was the same, but the divisor and quotient exchanged places."

GARY

$\begin{array}{r}8\\5\overline{)40}\end{array}$ $\qquad$ $\begin{array}{r}5\\8\overline{)40}\end{array}$

or

$40 \div 5 = 8$

$40 \div 8 = 5$

7. Think of each of the following division facts as one of a related pair. Write the pair of related division facts.

$\begin{array}{r}8\\4\overline{)32}\end{array}$ $\qquad$ $\begin{array}{r}9\\3\overline{)27}\end{array}$ $\qquad$ $\begin{array}{r}9\\5\overline{)45}\end{array}$ $\qquad$ $\begin{array}{r}9\\4\overline{)36}\end{array}$

Write a pair of related division facts for these numbers.

8. 3, 5, and 15 $\qquad$ 7, 4, and 28
9. 7, 3, and 21 $\qquad$ 6, 3, and 18
10. 5, 6, and 30 $\qquad$ 7, 5, and 35

Give the answers quickly for the following division questions. The sign ÷ means divided by.

11. $36 \div 9 = \boxed{?}$ $\qquad$ $\frac{1}{9}$ of $45 = \boxed{?}$
12. $30 \div 6 = \boxed{?}$ $\qquad$ $\frac{1}{5}$ of $45 = \boxed{?}$
13. $45 \div 9 = \boxed{?}$ $\qquad$ $\frac{1}{2}$ of $14 = \boxed{?}$
14. $\frac{1}{8}$ of $32 = \boxed{?}$ $\qquad$ $\frac{1}{7}$ of $14 = \boxed{?}$

Division with a Left-Over Part, or a Remainder

The teacher asked Bob to write a list of 22 words on the board for the class to study. He began writing 5 words in a column.

Bob thought, "If I make equal columns of 5 words, will I be able to copy all of the list on the board?"

1. How does this subtraction help Bob to answer his question?

Subtraction

$22 - 5 = 17$

$17 - 5 = 12$

$12 - 5 = 7$

$7 - 5 = 2$

2 left-over part

2. Before Bob finished writing all of the 22 words in columns, he wrote $5\overline{)22}$ on the board and divided to find his answer. He found there was a left-over part, or remainder. Study Bob's division. Explain how he found his answer.

BOB

$$\begin{array}{r} 4,\ r\ 2 \\ 5\overline{)22} \\ -\underline{20} \\ 2 \end{array}$$

3. What basic division fact did Bob have to know before he could begin dividing?

In each of the following rows, think of the basic division fact at the beginning of the row. Then do the uneven divisions. Show all your work as you divide.

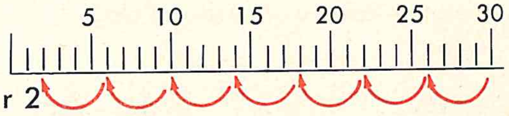
4. $\begin{array}{r} 6 \\ 5\overline{)30} \\ \underline{30} \end{array}$ $5\overline{)33}$ $5\overline{)31}$ $5\overline{)34}$

5. $\begin{array}{r} 7 \\ 4\overline{)28} \\ \underline{28} \end{array}$ $4\overline{)30}$ $4\overline{)29}$ $4\overline{)31}$

6. $\begin{array}{r} 9 \\ 4\overline{)36} \\ \underline{36} \end{array}$ $4\overline{)39}$ $4\overline{)37}$ $4\overline{)38}$

7. $\begin{array}{r} 9 \\ 5\overline{)45} \\ \underline{45} \end{array}$ $5\overline{)49}$ $5\overline{)46}$ $5\overline{)48}$

8. Betty used a number line to check an uneven division she had done. Study her number line. Then write her division with the quotient and left-over part.



Thinking About Uneven Division

1. Is there a remainder when you divide 40 by 5?

2. What is the remainder when you divide 24 by 5?

3. Which of these numbers can be divided by 3 without a remainder?

9 17 12 24 18 26

4. Which of these numbers can be divided by 2 without a remainder?

13 4 16 19 7 12 9

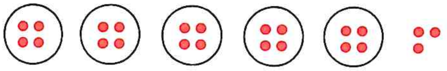
5. Which of these numbers can be divided by 5 without a remainder?

15 30 45 23 27 35 9

6. What is the remainder when you divide 17 by 4?

7. What basic division fact will you think when you divide $3\overline{)14}$?

8. Write the division example shown by this dot drawing.



Basic Division Facts as Helpers

1. Give the basic division fact that you would use for each of the following uneven divisions.

$4\overline{)5}$ $3\overline{)17}$ $5\overline{)36}$ $2\overline{)13}$ $5\overline{)48}$

■ **In uneven division, think back to the nearest basic division fact with the same divisor.**

Think of the basic division fact helper in the table below. Quickly give each quotient and the left-over part.

2. $2\overline{)9}$ $2\overline{)15}$ $2\overline{)5}$ $2\overline{)11}$

3. $2\overline{)17}$ $2\overline{)7}$ $2\overline{)13}$ $2\overline{)19}$

TABLE FOR DIVIDING BY 2

Basic Fact Helper	$\begin{array}{r}1\\2\overline{)2}\end{array}$	$\begin{array}{r}2\\2\overline{)4}\end{array}$	$\begin{array}{r}3\\2\overline{)6}\end{array}$	$\begin{array}{r}4\\2\overline{)8}\end{array}$	$\begin{array}{r}5\\2\overline{)10}\end{array}$	$\begin{array}{r}6\\2\overline{)12}\end{array}$	$\begin{array}{r}7\\2\overline{)14}\end{array}$	$\begin{array}{r}8\\2\overline{)16}\end{array}$	$\begin{array}{r}9\\2\overline{)18}\end{array}$
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Think back to the even division.	$2\overline{)3}$	$2\overline{)5}$	$2\overline{)7}$	$2\overline{)9}$	$2\overline{)11}$	$2\overline{)13}$	$2\overline{)15}$	$2\overline{)17}$	$2\overline{)19}$

TABLE FOR DIVIDING BY 3

Basic Fact Helper	$\begin{array}{r}1\\3\overline{)3}\end{array}$	$\begin{array}{r}2\\3\overline{)6}\end{array}$	$\begin{array}{r}3\\3\overline{)9}\end{array}$	$\begin{array}{r}4\\3\overline{)12}\end{array}$	$\begin{array}{r}5\\3\overline{)15}\end{array}$	$\begin{array}{r}6\\3\overline{)18}\end{array}$	$\begin{array}{r}7\\\overline{21}\end{array}$	$\begin{array}{r}8\\3\overline{)24}\end{array}$	$\begin{array}{r}9\\3\overline{)27}\end{array}$
↑	↑	↑	↑	↑	↑	↑		↑	↑
Think back to the even division above.	$3\overline{)4}$ $3\overline{)5}$	$3\overline{)7}$ $3\overline{)8}$	$3\overline{)10}$ $3\overline{)11}$	$3\overline{)13}$?	$3\overline{)16}$ $3\overline{)17}$	$3\overline{)19}$ $3\overline{)20}$	$3\overline{)\ }$ $3\overline{)2}$	$3\overline{)25}$?	? ?

4. Make up a division question for each question mark in the table above. Answer your questions.

Quickly give the quotients and left-over parts.

5. $3\overline{)23}$ $3\overline{)16}$ $3\overline{)11}$ $3\overline{)19}$

6. $3\overline{)17}$ $3\overline{)22}$ $3\overline{)29}$ $3\overline{)28}$

7. Make up a division estion for each question mark in table below. Answer your questi

Give the quotients and l ver parts quickly.

8. $4\overline{)19}$ $4\overline{)22}$ $4\overline{)38}$ $\overline{27}$

9. $4\overline{)29}$ $4\overline{)23}$ $4\overline{)33}$

TABLE FOR DIVIDING BY 4

Basic Fact Helper	$\begin{array}{r}1\\4\overline{)4}\end{array}$	$\begin{array}{r}2\\4\overline{)8}\end{array}$	$\begin{array}{r}3\\4\overline{)12}\end{array}$	$\begin{array}{r}4\\4\overline{)16}\end{array}$	$\begin{array}{r}5\\4\overline{)20}\end{array}$	$\begin{array}{r}6\\4\overline{)24}\end{array}$	$\begin{array}{r}7\\4\overline{)28}\end{array}$	$\begin{array}{r}8\\4\overline{)32}\end{array}$	
↑	↑	↑	↑	↑	↑	↑	↑	↑	
Think back to the even division above.	$4\overline{)5}$ $4\overline{)6}$ $4\overline{)7}$	$4\overline{)9}$ $4\overline{)10}$ $4\overline{)11}$	$4\overline{)13}$ $4\overline{)14}$ $4\overline{)15}$	$4\overline{)17}$ $4\overline{)18}$ $4\overline{)19}$	$4\overline{)21}$ $4\overline{)22}$ $4\overline{)23}$	$4\overline{)25}$ $4\overline{)26}$ $4\overline{)27}$	$4\overline{)29}$? ?	$4\overline{)33}$? ?	$4\overline{)3}$? ?

TABLE FOR DIVIDING BY 5

Basic Fact Helper	$\begin{array}{r}1\\5\overline{)5}\end{array}$	$\begin{array}{r}2\\5\overline{)10}\end{array}$	$\begin{array}{r}3\\5\overline{)15}\end{array}$	$\begin{array}{r}4\\5\overline{)20}\end{array}$	$\begin{array}{r}5\\5\overline{)25}\end{array}$	$\begin{array}{r}6\\5\overline{)30}\end{array}$	$\begin{array}{r}7\\5\overline{)35}\end{array}$	$\begin{array}{r}8\\5\overline{)40}\end{array}$	$\begin{array}{r}9\\5\overline{)45}\end{array}$
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Think back to the even division above.	$5\overline{)6}$	$5\overline{)11}$	$5\overline{)16}$	$5\overline{)21}$	$5\overline{)26}$	$5\overline{)31}$	$5\overline{)36}$	$5\overline{)41}$	$5\overline{)46}$
	$5\overline{)7}$	?	$5\overline{)17}$	$5\overline{)22}$	?	$5\overline{)32}$	$5\overline{)37}$	$5\overline{)42}$	$5\overline{)47}$
	?	$5\overline{)13}$	$5\overline{)18}$	$5\overline{)23}$	?	?	?	?	?
	$5\overline{)9}$	$5\overline{)14}$	$5\overline{)19}$	$5\overline{)24}$	$5\overline{)29}$	?	?	?	?

Reviewing Things You Know About Division

1. Write and answer the missing division questions that belong in the table above. Show all of your work when you divide.

▶ Copy. Divide. Show all your work.

2. $5\overline{)24}$ $3\overline{)14}$ $2\overline{)19}$ $4\overline{)39}$

3. $5\overline{)38}$ $2\overline{)9}$ $4\overline{)27}$ $3\overline{)29}$

4. $2\overline{)15}$ $5\overline{)48}$ $3\overline{)20}$ $4\overline{)23}$

5. $4\overline{)11}$ $3\overline{)17}$ $5\overline{)42}$ $3\overline{)26}$

6. $5\overline{)14}$ $4\overline{)29}$ $3\overline{)23}$ $5\overline{)36}$

7. Check Jack's division by using a number line. Is his quotient correct?

JACK

$$\begin{array}{r} 5,\ \text{r}\ 3 \\ 5\overline{)28} \\ -25 \\ \hline 3 \end{array}$$

8. Check Betty's division by making a dot drawing. Is her division correct?

BETTY

$$\begin{array}{r} 8,\ \text{r}\ 3 \\ 4\overline{)35} \\ -32 \\ \hline 3 \end{array}$$

A New Step in Dividing

Four boys bought 5 dozen rubber rings for jar lids to use in playing a game. They wanted to divide the 60 rings equally.

1. How many rings should each boy get? If you cannot find the answer by dividing, use counting.

2. Jack tried to answer problem 1. He wrote $4\overline{)60}$. He thought, "I do not know how many 4's = 60. I will try 10 for my answer."

Look at Jack's work. Where did he write the 10? Where did he get the 40 he subtracted? How did he get the answer 15?

JACK

$$\begin{array}{rl} \left.\begin{array}{r}5\\10\end{array}\right\} & =15 \\ 4\overline{)60} & \\ -40 & \\ \hline 20 & \\ -20 & \\ \hline \end{array}$$

3. Mary solved problem 1 like this. What part of Mary's division was easier than Jack's?

MARY

$$4\overline{)60} = \begin{array}{l} \quad\text{1 ten and 5 ones} \\ 4\overline{)\text{6 tens}} \\ -\text{4 tens} \\ \hline \text{2 tens} = \text{20 ones} \\ \qquad\qquad -\text{20 ones} \\ \hline \end{array}$$

▶ Copy. Use Jack's way to answer these division questions.

4. $2\overline{)50}$ $2\overline{)80}$ $4\overline{)72}$ $5\overline{)75}$

▶ Copy. Use Mary's way to answer these division questions.

5. $3\overline{)60}$ $4\overline{)90}$ $5\overline{)70}$ $2\overline{)70}$

6. In the division shown here, the words tens and ones are not written in the dividend and quotient. Is the writing of tens and ones necessary? Why?

$$\begin{array}{r} 28 \\ 3\overline{)84} \\ -6\downarrow \\ \hline 24 \\ -24 \\ \hline \end{array}$$

Explain why these quotient figures are in tens place.

7. $\begin{array}{r}2\\3\overline{)87}\end{array}$ $\begin{array}{r}2\\4\overline{)96}\end{array}$ $\begin{array}{r}4\\2\overline{)94}\end{array}$ $\begin{array}{r}1\\5\overline{)95}\end{array}$

8. $\begin{array}{r}7\\5\overline{)375}\end{array}$ $\begin{array}{r}6\\4\overline{)252}\end{array}$ $\begin{array}{r}6\\3\overline{)195}\end{array}$ $\begin{array}{r}8\\2\overline{)178}\end{array}$

▶ Copy. Divide as shown in example 6.

9. $2\overline{)98}$ $3\overline{)51}$ $4\overline{)92}$ $5\overline{)65}$

10. $3\overline{)294}$ $4\overline{)296}$ $2\overline{)158}$

11. $5\overline{)480}$ $3\overline{)258}$ $4\overline{)172}$

12. $4\overline{)152}$ $5\overline{)335}$ $2\overline{)136}$

13. $5\overline{)360}$ $3\overline{)117}$ $4\overline{)232}$

Thinking What Numbers Mean

1. Write the number that is shown on each row on the place-value frame.

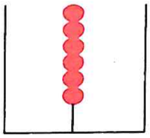
2. Make a place-value frame with four rows. On the first row show the number 309. On the second row show 84. On the third row show 40. On the fourth row show 520.

3. Use figures. Write the number that is 9 tens and 3 ones. Write the number that is 12 tens and 6 ones.

4. In the number 284 what figure is in tens place?

5. Sixteen tens are equal to how many ones?

6. Use figures. Write the number shown on the following abacus.



ANN

$$\begin{array}{r}3\\2\overline{)60}\end{array}$$

7. Ann began this division. Why did she write her first quotient figure in tens place? The abacus picture above can help you answer. Finish Ann's dividing.

<table>
<tr><th>hundreds</th><th>tens</th><th>ones</th></tr>
<tr><td></td><td>||||||</td><td>||||</td></tr>
<tr><td></td><td>|</td><td>||||||</td></tr>
<tr><td>||||</td><td></td><td>||</td></tr>
<tr><td>||</td><td>||||||</td><td>||||</td></tr>
</table>

8. Bill divided 64 by 2. He said, "I thought of 64 on the place-value frame, and then divided."

BILL

$$\begin{array}{r}3 \text{ tens } 2 \text{ ones}\\2\overline{)6 \text{ tens } 4 \text{ ones}}\end{array}$$

Do Bill's division using figures only. Explain how you can tell where to write each quotient figure.

9. Sue divided 264 by 2.

SUE

$$\begin{array}{r}132\\2\overline{)264}\end{array}$$

Why did she write her first quotient figure in hundreds place? Row 4 on the place-value frame can help you. What does the 3 in Sue's quotient mean?

10. Do Sue's division example, using figures and the words hundreds, tens, and ones.

▶ Copy. Write the quotients.

11. $3\overline{)96}$ $3\overline{)63}$ $3\overline{)39}$ $3\overline{)69}$

12. $4\overline{)48}$ $4\overline{)40}$ $4\overline{)84}$ $4\overline{)44}$

13. $4\overline{)848}$ $3\overline{)369}$ $2\overline{)846}$ $3\overline{)936}$

Dividing and Checking

Bob's class wanted to fill 4 baskets with apples to give to four needy families. The class brought 168 apples. Bob said the class could put 42 apples in each basket. Bob showed the division at the right to the class.

BOB

$$\begin{array}{r} 42 \\ 4\overline{)168} \end{array}$$

1. Why did Bob have no hundreds in his quotient?

2. When Bob thought, "16," was he thinking 16 hundreds, 16 tens, or 16 ones?

3. Where did Bob write his first quotient figure? Why?

4. Bob said that instead of using figures only, he could have used figures and words. Look at his work below.

BOB

$$\begin{array}{r} \boxed{?}\text{ tens }\boxed{?}\text{ ones} \\ 4\overline{)16\text{ tens }8\text{ ones}} \end{array}$$

Give the figures that Bob should write in place of the question marks in his quotient.

5. Use figures and words. Divide 279 by 3.

6. Ruth did this division. To be sure that her division was correct, she used a check. Explain her division and her check.

RUTH

$$\begin{array}{rl} 91 & \\ 5\overline{)455} & \\ -450 & (5\times 90) \\ \hline 5 & \\ -5 & (5\times 1) \\ \hline 0 & \end{array} \qquad \begin{array}{r} \text{CHECK} \\ 91 \\ \times 5 \\ \hline 455 \end{array}$$

7. Check Ruth's quotient by adding.

8. Copy. Divide each of these numbers by 3. Check by multiplying.

246 183 159 213 129

■ **To check a division example when there is no remainder, multiply the quotient by the divisor.**

▶ Copy. Divide. Check quotients.

9. $5\overline{)255}$ $3\overline{)249}$ $2\overline{)188}$

10. $2\overline{)126}$ $4\overline{)324}$ $4\overline{)288}$

11. $4\overline{)368}$ $5\overline{)355}$ $3\overline{)219}$

12. $5\overline{)205}$ $2\overline{)146}$ $3\overline{)129}$

13. $2\overline{)184}$ $4\overline{)208}$ $3\overline{)276}$

14. $5\overline{)305}$ $2\overline{)164}$ $4\overline{)248}$

Keeping in Practice

▶ Copy. Find the answers. Watch the signs.

1. $\begin{array}{r}357\\ \times 3\\ \hline\end{array}$ $\begin{array}{r}8940\\ -97\\ \hline\end{array}$ $\begin{array}{r}508\\ +794\\ \hline\end{array}$ $\begin{array}{r}104\\ -92\\ \hline\end{array}$

2. $5\overline{)57}$ $3\overline{)369}$ $4\overline{)188}$ $3\overline{)78}$

3. $\begin{array}{r}803\\ \times 5\\ \hline\end{array}$ $\begin{array}{r}800\\ -595\\ \hline\end{array}$ $\begin{array}{r}894\\ \times 3\\ \hline\end{array}$ $\begin{array}{r}1584\\ -1326\\ \hline\end{array}$

4. $\begin{array}{r}45\\ 38\\ 26\\ +18\\ \hline\end{array}$ $\begin{array}{r}4950\\ 268\\ +1594\\ \hline\end{array}$ $\begin{array}{r}9\\ 7\\ 8\\ +3\\ \hline\end{array}$ $\begin{array}{r}178\\ 425\\ 734\\ +958\\ \hline\end{array}$

5. $5\overline{)575}$ $2\overline{)846}$ $4\overline{)276}$

▶ Use folded paper. Write the quotients quickly.

6. $9\overline{)45}$ $5\overline{)45}$ $4\overline{)28}$ $7\overline{)21}$

7. $6\overline{)24}$ $3\overline{)12}$ $7\overline{)28}$ $6\overline{)30}$

8. $5\overline{)35}$ $8\overline{)32}$ $9\overline{)36}$ $7\overline{)14}$

9. $8\overline{)24}$ $4\overline{)36}$ $3\overline{)27}$ $8\overline{)40}$

10. $9\overline{)27}$ $3\overline{)21}$ $5\overline{)40}$ $4\overline{)32}$

Answers Only

1. How many 8's equal 24?

2. How many are six 5's?

3. How many 9's equal 27?

4. The number 36 divided by 4 equals what number?

5. What number means 27 tens and 5 ones?

6. Which of these divisions will have two-figure quotients?

$4\overline{)64}$ $3\overline{)279}$ $2\overline{)248}$ $5\overline{)25}$

7. Which of these divisions will have three-figure quotients?

$3\overline{)936}$ $2\overline{)400}$ $5\overline{)355}$ $4\overline{)144}$

8. If you divide $4\overline{)96}$, how many tens will you write in the quotient?

9. If you divide $3\overline{)285}$, how many tens will you write in the quotient?

10. What division fact can you make from $8 \times 4 = 32$?

11. What basic division fact do you think when you divide 26 by 4?

12. If you subtract 3 from 20 six times, what will be left over?

13. How can you find $\frac{1}{4}$ of 84 using figures only?

14. Which is more, 15 or $\frac{1}{2}$ of 30?

Division with a Left-Over Part, or a Remainder

The teacher asked Bob to write a list of 22 words on the board for the class to study. He began writing 5 words in a column.

Bob thought, "If I make equal columns of 5 words, will I be able to copy all of the list on the board?"

1. How does this subtraction help Bob to answer his question?

Subtraction

$22 - 5 = 17$
$17 - 5 = 12$
$12 - 5 = 7$
$7 - 5 = 2$
2 left-over part

2. Before Bob finished writing all of the 22 words in columns, he wrote $5\overline{)22}$ on the board and divided to find his answer. He found there was a left-over part, or remainder. Study Bob's division. Explain how he found his answer.

BOB

$$\begin{array}{r} 4, \text{ r } 2 \\ 5\overline{)22} \\ -20 \\ \hline 2 \end{array}$$

3. What basic division fact did Bob have to know before he could begin dividing?

In each of the following rows, think of the basic division fact at the beginning of the row. Then do the uneven divisions. Show all your work as you divide.

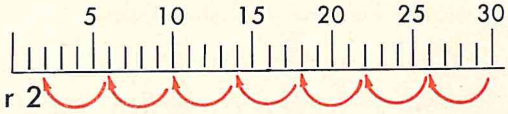
4. $\begin{array}{r} 6 \\ 5\overline{)30} \\ 30 \\ \hline \end{array}$ $5\overline{)33}$ $5\overline{)31}$ $5\overline{)34}$

5. $\begin{array}{r} 7 \\ 4\overline{)28} \\ 28 \\ \hline \end{array}$ $4\overline{)30}$ $4\overline{)29}$ $4\overline{)31}$

6. $\begin{array}{r} 9 \\ 4\overline{)36} \\ 36 \\ \hline \end{array}$ $4\overline{)39}$ $4\overline{)37}$ $4\overline{)38}$

7. $\begin{array}{r} 9 \\ 5\overline{)45} \\ 45 \\ \hline \end{array}$ $5\overline{)49}$ $5\overline{)46}$ $5\overline{)48}$

8. Betty used a number line to check an uneven division she had done. Study her number line. Then write her division with the quotient and left-over part.



Thinking About Uneven Division

1. Is there a remainder when you divide 40 by 5?

2. What is the remainder when you divide 24 by 5?

3. Which of these numbers can be divided by 3 without a remainder?

9 17 12 24 18 26

4. Which of these numbers can be divided by 2 without a remainder?

13 4 16 19 7 12 9

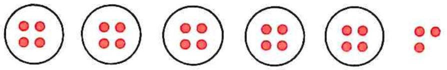
5. Which of these numbers can be divided by 5 without a remainder?

15 30 45 23 27 35 9

6. What is the remainder when you divide 17 by 4?

7. What basic division fact will you think when you divide $3\overline{)14}$?

8. Write the division example shown by this dot drawing.



Basic Division Facts as Helpers

1. Give the basic division fact that you would use for each of the following uneven divisions.

$4\overline{)5}$ $3\overline{)17}$ $5\overline{)36}$ $2\overline{)13}$ $5\overline{)48}$

■ **In uneven division, think back to the nearest basic division fact with the same divisor.**

Think of the basic division fact helper in the table below. Quickly give each quotient and the left-over part.

2. $2\overline{)9}$ $2\overline{)15}$ $2\overline{)5}$ $2\overline{)11}$

3. $2\overline{)17}$ $2\overline{)7}$ $2\overline{)13}$ $2\overline{)19}$

TABLE FOR DIVIDING BY 2

Basic Fact Helper	$\begin{array}{r}1\\2\overline{)2}\end{array}$	$\begin{array}{r}2\\2\overline{)4}\end{array}$	$\begin{array}{r}3\\2\overline{)6}\end{array}$	$\begin{array}{r}4\\2\overline{)8}\end{array}$	$\begin{array}{r}5\\2\overline{)10}\end{array}$	$\begin{array}{r}6\\2\overline{)12}\end{array}$	$\begin{array}{r}7\\2\overline{)14}\end{array}$	$\begin{array}{r}8\\2\overline{)16}\end{array}$	$\begin{array}{r}9\\2\overline{)18}\end{array}$
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Think back to the even division.	$2\overline{)3}$	$2\overline{)5}$	$2\overline{)7}$	$2\overline{)9}$	$2\overline{)11}$	$2\overline{)13}$	$2\overline{)15}$	$2\overline{)17}$	$2\overline{)19}$

TABLE FOR DIVIDING BY 3

Basic Fact Helper	$\overset{1}{3\overline{)3}}$	$\overset{2}{3\overline{)6}}$	$\overset{3}{3\overline{)9}}$	$\overset{4}{3\overline{)12}}$	$\overset{5}{3\overline{)15}}$	$\overset{6}{3\overline{)18}}$	$\overset{7}{3\overline{)21}}$	$\overset{8}{3\overline{)24}}$	$\overset{9}{3\overline{)27}}$
Think back to the even division above.	$3\overline{)4}$ $3\overline{)5}$	$3\overline{)7}$ $3\overline{)8}$	$3\overline{)10}$ $3\overline{)11}$	$3\overline{)13}$?	$3\overline{)16}$ $3\overline{)17}$	$3\overline{)19}$ $3\overline{)20}$	$3\overline{)22}$ $3\overline{)23}$	$3\overline{)25}$?	? ?

4. Make up a division question for each question mark in the table above. Answer your questions.

Quickly give the quotients and left-over parts.

5. $3\overline{)23}$ $3\overline{)16}$ $3\overline{)11}$ $3\overline{)19}$

6. $3\overline{)17}$ $3\overline{)22}$ $3\overline{)29}$ $3\overline{)28}$

7. Make up a division question for each question mark in the table below. Answer your questions.

Give the quotients and left-over parts quickly.

8. $4\overline{)19}$ $4\overline{)22}$ $4\overline{)38}$ $4\overline{)27}$

9. $4\overline{)29}$ $4\overline{)23}$ $4\overline{)33}$ $4\overline{)39}$

TABLE FOR DIVIDING BY 4

Basic Fact Helper	$\overset{1}{4\overline{)4}}$	$\overset{2}{4\overline{)8}}$	$\overset{3}{4\overline{)12}}$	$\overset{4}{4\overline{)16}}$	$\overset{5}{4\overline{)20}}$	$\overset{6}{4\overline{)24}}$	$\overset{7}{4\overline{)28}}$	$\overset{8}{4\overline{)32}}$	$\overset{9}{4\overline{)36}}$
Think back to the even division above.	$4\overline{)5}$ $4\overline{)6}$ $4\overline{)7}$	$4\overline{)9}$ $4\overline{)10}$ $4\overline{)11}$	$4\overline{)13}$ $4\overline{)14}$ $4\overline{)15}$	$4\overline{)17}$ $4\overline{)18}$ $4\overline{)19}$	$4\overline{)21}$ $4\overline{)22}$ $4\overline{)23}$	$4\overline{)25}$ $4\overline{)26}$ $4\overline{)27}$	$4\overline{)29}$? ?	$4\overline{)33}$? ?	$4\overline{)37}$? ?

TABLE FOR DIVIDING BY 5

Basic Fact Helper	$\begin{array}{r}1\\5\overline{)5}\end{array}$	$\begin{array}{r}2\\5\overline{)10}\end{array}$	$\begin{array}{r}3\\5\overline{)15}\end{array}$	$\begin{array}{r}4\\5\overline{)20}\end{array}$	$\begin{array}{r}5\\5\overline{)25}\end{array}$	$\begin{array}{r}6\\5\overline{)30}\end{array}$	$\begin{array}{r}7\\5\overline{)35}\end{array}$	$\begin{array}{r}8\\5\overline{)40}\end{array}$	$\begin{array}{r}9\\5\overline{)45}\end{array}$
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Think back to the even division above.	$5\overline{)6}$	$5\overline{)11}$	$5\overline{)16}$	$5\overline{)21}$	$5\overline{)26}$	$5\overline{)31}$	$5\overline{)36}$	$5\overline{)41}$	$5\overline{)46}$
	$5\overline{)7}$	?	$5\overline{)17}$	$5\overline{)22}$	?	$5\overline{)32}$	$5\overline{)37}$	$5\overline{)42}$	$5\overline{)47}$
	?	$5\overline{)13}$	$5\overline{)18}$	$5\overline{)23}$	?	?	?	?	?
	$5\overline{)9}$	$5\overline{)14}$	$5\overline{)19}$	$5\overline{)24}$	$5\overline{)29}$	?	?	?	?

Reviewing Things You Know About Division

1. Write and answer the missing division questions that belong in the table above. Show all of your work when you divide.

▶ Copy. Divide. Show all your work.

2. $5\overline{)24}$ $3\overline{)14}$ $2\overline{)19}$ $4\overline{)39}$
3. $5\overline{)38}$ $2\overline{)9}$ $4\overline{)27}$ $3\overline{)29}$
4. $2\overline{)15}$ $5\overline{)48}$ $3\overline{)20}$ $4\overline{)23}$
5. $4\overline{)11}$ $3\overline{)17}$ $5\overline{)42}$ $3\overline{)26}$
6. $5\overline{)14}$ $4\overline{)29}$ $3\overline{)23}$ $5\overline{)36}$
7. Check Jack's division by using a number line. Is his quotient correct?

JACK

$$\begin{array}{r} 5,\ \text{r } 3 \\ 5\overline{)28} \\ -\ 25 \\ \hline 3 \end{array}$$

8. Check Betty's division by making a dot drawing. Is her division correct?

BETTY

$$\begin{array}{r} 8,\ \text{r } 3 \\ 4\overline{)35} \\ -\ 32 \\ \hline 3 \end{array}$$

A New Step in Dividing

Four boys bought 5 dozen rubber rings for jar lids to use in playing a game. They wanted to divide the 60 rings equally.

1. How many rings should each boy get? If you cannot find the answer by dividing, use counting.

2. Jack tried to answer problem 1. He wrote $4\overline{)60}$. He thought, "I do not know how many 4's = 60. I will try 10 for my answer."

Look at Jack's work. Where did he write the 10? Where did he get the 40 he subtracted? How did he get the answer 15?

JACK

$$\begin{array}{r} \left.\begin{array}{r}5\\10\end{array}\right\}=15 \\ 4\overline{)60} \\ -40 \\ \hline 20 \\ -20 \\ \hline \end{array}$$

3. Mary solved problem 1 like this. What part of Mary's division was easier than Jack's?

MARY

$$4\overline{)60} = \begin{array}{l} \text{1 ten and 5 ones} \\ 4\overline{)6\text{ tens}} \\ -4\text{ tens} \\ \hline 2\text{ tens} = 20\text{ ones} \\ -20\text{ ones} \\ \hline \end{array}$$

▶ Copy. Use Jack's way to answer these division questions.

4. $2\overline{)50}$ $2\overline{)80}$ $4\overline{)72}$ $5\overline{)75}$

▶ Copy. Use Mary's way to answer these division questions.

5. $3\overline{)60}$ $4\overline{)90}$ $5\overline{)70}$ $2\overline{)70}$

6. In the division shown here, the words tens and ones are not written in the dividend and quotient. Is the writing of tens and ones necessary? Why?

$$\begin{array}{r} 28 \\ 3\overline{)84} \\ -6\downarrow \\ \hline 24 \\ -24 \\ \hline \end{array}$$

Explain why these quotient figures are in tens place.

7. $\begin{array}{r} 2 \\ 3\overline{)87} \end{array}$ $\begin{array}{r} 2 \\ 4\overline{)96} \end{array}$ $\begin{array}{r} 4 \\ 2\overline{)94} \end{array}$ $\begin{array}{r} 1 \\ 5\overline{)95} \end{array}$

8. $\begin{array}{r} 7 \\ 5\overline{)375} \end{array}$ $\begin{array}{r} 6 \\ 4\overline{)252} \end{array}$ $\begin{array}{r} 6 \\ 3\overline{)195} \end{array}$ $\begin{array}{r} 8 \\ 2\overline{)178} \end{array}$

▶ Copy. Divide as shown in example 6.

9. $2\overline{)98}$ $3\overline{)51}$ $4\overline{)92}$ $5\overline{)65}$

10. $3\overline{)294}$ $4\overline{)296}$ $2\overline{)158}$

11. $5\overline{)480}$ $3\overline{)258}$ $4\overline{)172}$

12. $4\overline{)152}$ $5\overline{)335}$ $2\overline{)136}$

13. $5\overline{)360}$ $3\overline{)117}$ $4\overline{)232}$

Thinking What Numbers Mean

1. Write the number that is shown on each row on the place-value frame.

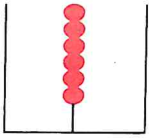
2. Make a place-value frame with four rows. On the first row show the number 309. On the second row show 84. On the third row show 40. On the fourth row show 520.

3. Use figures. Write the number that is 9 tens and 3 ones. Write the number that is 12 tens and 6 ones.

4. In the number 284 what figure is in tens place?

5. Sixteen tens are equal to how many ones?

6. Use figures. Write the number shown on the following abacus.



ANN

$$\begin{array}{r} 3 \\ 2\overline{)60} \end{array}$$

7. Ann began this division. Why did she write her first quotient figure in tens place? The abacus picture above can help you answer. Finish Ann's dividing.

hundreds	tens	ones
	ǀǀǀǀǀǀ	ǀǀǀǀ
	ǀ	ǀǀǀǀǀǀ
ǀǀǀǀ		ǀǀ
ǀǀ	ǀǀǀǀǀǀ	ǀǀǀǀ

8. Bill divided 64 by 2. He said, "I thought of 64 on the place-value frame, and then divided."

BILL

$$\begin{array}{r} 3 \text{ tens } 2 \text{ ones} \\ 2\overline{)6 \text{ tens } 4 \text{ ones}} \end{array}$$

Do Bill's division using figures only. Explain how you can tell where to write each quotient figure.

9. Sue divided 264 by 2.

SUE

$$\begin{array}{r} 132 \\ 2\overline{)264} \end{array}$$

Why did she write her first quotient figure in hundreds place? Row 4 on the place-value frame can help you. What does the 3 in Sue's quotient mean?

10. Do Sue's division example, using figures and the words hundreds, tens, and ones.

▶ Copy. Write the quotients.

11. $3\overline{)96}$ $3\overline{)63}$ $3\overline{)39}$ $3\overline{)69}$

12. $4\overline{)48}$ $4\overline{)40}$ $4\overline{)84}$ $4\overline{)44}$

13. $4\overline{)848}$ $3\overline{)369}$ $2\overline{)846}$ $3\overline{)936}$

Dividing and Checking

Bob's class wanted to fill 4 baskets with apples to give to four needy families. The class brought 168 apples. Bob said the class could put 42 apples in each basket. Bob showed the division at the right to the class.

BOB

$$\begin{array}{r} 42 \\ 4\overline{)168} \end{array}$$

1. Why did Bob have no hundreds in his quotient?

2. When Bob thought, "16," was he thinking 16 hundreds, 16 tens, or 16 ones?

3. Where did Bob write his first quotient figure? Why?

4. Bob said that instead of using figures only, he could have used figures and words. Look at his work below.

BOB

$$\begin{array}{r} \boxed{?}\text{ tens } \boxed{?}\text{ ones} \\ 4\overline{)16\text{ tens } 8\text{ ones}} \end{array}$$

Give the figures that Bob should write in place of the question marks in his quotient.

5. Use figures and words. Divide 279 by 3.

6. Ruth did this division. To be sure that her division was correct, she used a check. Explain her division and her check.

RUTH

$$\begin{array}{rl} 91 & \\ 5\overline{)455} & \\ -\underline{450} & (5 \times 90) \\ 5 & \\ -\underline{5} & (5 \times 1) \\ 0 & \end{array} \qquad \begin{array}{r} \text{CHECK} \\ 91 \\ \underline{\times 5} \\ 455 \end{array}$$

7. Check Ruth's quotient by adding.

8. Copy. Divide each of these numbers by 3. Check by multiplying.

246 183 159 213 129

■ **To check a division example when there is no remainder, multiply the quotient by the divisor.**

▶ Copy. Divide. Check quotients.

9. $5\overline{)255}$ $3\overline{)249}$ $2\overline{)188}$

10. $2\overline{)126}$ $4\overline{)324}$ $4\overline{)288}$

11. $4\overline{)368}$ $5\overline{)355}$ $3\overline{)219}$

12. $5\overline{)205}$ $2\overline{)146}$ $3\overline{)129}$

13. $2\overline{)184}$ $4\overline{)208}$ $3\overline{)276}$

14. $5\overline{)305}$ $2\overline{)164}$ $4\overline{)248}$

Keeping in Practice

Copy. Find the answers. Watch the signs.

1. $\begin{array}{r}357\\ \times 3\\ \hline\end{array}$ $\quad\begin{array}{r}8940\\ -97\\ \hline\end{array}$ $\quad\begin{array}{r}508\\ +794\\ \hline\end{array}$ $\quad\begin{array}{r}104\\ -92\\ \hline\end{array}$

2. $5\overline{)57}$ $\quad 3\overline{)369}$ $\quad 4\overline{)188}$ $\quad 3\overline{)78}$

3. $\begin{array}{r}803\\ \times 5\\ \hline\end{array}$ $\quad\begin{array}{r}800\\ -595\\ \hline\end{array}$ $\quad\begin{array}{r}894\\ \times 3\\ \hline\end{array}$ $\quad\begin{array}{r}1584\\ -1326\\ \hline\end{array}$

4. $\begin{array}{r}45\\ 38\\ 26\\ +18\\ \hline\end{array}$ $\quad\begin{array}{r}4950\\ 268\\ +1594\\ \hline\end{array}$ $\quad\begin{array}{r}9\\ 7\\ 8\\ +3\\ \hline\end{array}$ $\quad\begin{array}{r}178\\ 425\\ 734\\ +958\\ \hline\end{array}$

5. $5\overline{)575}$ $\quad 2\overline{)846}$ $\quad 4\overline{)276}$

Use folded paper. Write the quotients quickly.

6. $9\overline{)45}$ $\quad 5\overline{)45}$ $\quad 4\overline{)28}$ $\quad 7\overline{)21}$

7. $6\overline{)24}$ $\quad 3\overline{)12}$ $\quad 7\overline{)28}$ $\quad 6\overline{)30}$

8. $5\overline{)35}$ $\quad 8\overline{)32}$ $\quad 9\overline{)36}$ $\quad 7\overline{)14}$

9. $8\overline{)24}$ $\quad 4\overline{)36}$ $\quad 3\overline{)27}$ $\quad 8\overline{)40}$

10. $9\overline{)27}$ $\quad 3\overline{)21}$ $\quad 5\overline{)40}$ $\quad 4\overline{)32}$

Answers Only

1. How many 8's equal 24?

2. How many are six 5's?

3. How many 9's equal 27?

4. The number 36 divided by 4 equals what number?

5. What number means 27 tens and 5 ones?

6. Which of these divisions will have two-figure quotients?

$4\overline{)64}$ $\quad 3\overline{)279}$ $\quad 2\overline{)248}$ $\quad 5\overline{)25}$

7. Which of these divisions will have three-figure quotients?

$3\overline{)936}$ $\quad 2\overline{)400}$ $\quad 5\overline{)355}$ $\quad 4\overline{)144}$

8. If you divide $4\overline{)96}$, how many tens will you write in the quotient?

9. If you divide $3\overline{)285}$, how many tens will you write in the quotient?

10. What division fact can you make from $8 \times 4 = 32$?

11. What basic division fact do you think when you divide 26 by 4?

12. If you subtract 3 from 20 six times, what will be left over?

13. How can you find $\frac{1}{4}$ of 84 using figures only?

14. Which is more, 15 or $\frac{1}{2}$ of 30?

Measuring Improvement—Test 4

Find out if you are improving in arithmetic.

The teacher will tell you when to begin and when to stop. Write answers for rows 1, 2, and 3 on folded paper.

1. $6\overline{)12}$ $4\overline{)16}$ $7\overline{)28}$ $6\overline{)30}$

2. $9\overline{)36}$ $8\overline{)40}$ $6\overline{)24}$ $8\overline{)32}$

3. $6\overline{)18}$ $9\overline{)45}$ $4\overline{)28}$ $3\overline{)27}$

Copy. Find the answers.

4. $4\overline{)48}$ $3\overline{)36}$ $5\overline{)155}$ $4\overline{)248}$

5. $3\overline{)699}$ $2\overline{)428}$ $3\overline{)363}$ $4\overline{)844}$

6. $\begin{array}{r}697\\ \times 9\\ \hline\end{array}$ $\begin{array}{r}452\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}1483\\ +9075\\ \hline\end{array}$ $\begin{array}{r}9486\\ -4895\\ \hline\end{array}$

7. $\begin{array}{r}5980\\ -5926\\ \hline\end{array}$ $\begin{array}{r}\$29.00\\ -15.43\\ \hline\end{array}$ $\begin{array}{r}9827\\ +516\\ \hline\end{array}$

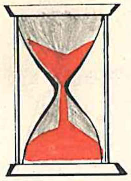
8. From three thousand twenty-six subtract two hundred four.

9. Multiply 509 by 7.

10. Subtract 72 from 9000.

11. $29+530+76+9+12=\boxed{?}$

12. Multiply 431 by 6.



Check your answers with a set of right answers.

On your paper write the number of right answers that you got. Then write the number of minutes you worked and the date.

Call this paper, "Improvement Test 4." Keep this test in your arithmetic notebook with your other improvement tests.

Did you get more right answers on this test than on your other improvement tests? Does your work show that you are improving?

Things to Help You Improve

1. Study pages 98, 99, and 100.

▶ Copy. Find the answers. Show all of your work.

2. $8\overline{)16}$ $7\overline{)21}$ $5\overline{)49}$ $4\overline{)36}$

3. $2\overline{)19}$ $4\overline{)22}$ $5\overline{)38}$ $3\overline{)17}$

4. $3\overline{)39}$ $3\overline{)84}$ $4\overline{)208}$ $6\overline{)126}$

5. $3\overline{)11}$ $5\overline{)95}$ $2\overline{)604}$ $4\overline{)324}$

6. $2\overline{)78}$ $4\overline{)64}$ $5\overline{)357}$ $2\overline{)124}$

7. $\frac{1}{4}$ of 48 $\frac{1}{2}$ of 54 $\frac{1}{3}$ of 639

How Well Have You Learned?

This page deals with the work you did in this unit. If you understand the things you are asked to do and the questions you are given to answer, you have learned the work in this unit well.

1. In which of these divisions did Tom have to divide 36 ones by 4?

TOM

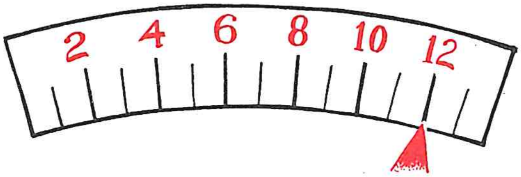
$$\begin{array}{r} 24 \\ 4\overline{)96} \end{array} \qquad \begin{array}{r} 21 \\ 4\overline{)84} \end{array} \qquad \begin{array}{r} 19 \\ 4\overline{)76} \end{array}$$

2. Joan wanted to divide 48 cookies among 5 children. She thought, "Nine 5's equal 45." What did she do to find how many cookies would be left over?

3. What number is subtracted in each of these divisions?

$$\begin{array}{r} 6, \text{ r } 3 \\ 4\overline{)27} \\ -\boxed{?} \\ \hline \end{array} \qquad \begin{array}{r} 6, \text{ r } 1 \\ 3\overline{)19} \\ -\boxed{?} \\ \hline \end{array} \qquad \begin{array}{r} 5, \text{ r } 4 \\ 5\overline{)29} \\ -\boxed{?} \\ \hline \end{array}$$

4. Jerry has 34 pennies. He wants to change his pennies into nickels. How many nickels can he get? How many pennies will be left over? Make a dot drawing to show that your answer is right.



5. Ann has 35¢. She wants to buy as many 6¢ stamps as she can with her money. Use a number line and show how many stamps she can buy and how many cents she will have left over.

6. Don found the answer to Ann's problem by subtracting. Show Don's work.

7. Bill said that $\frac{1}{4}$ of 20 is the same as $4\overline{)20}$. Use a dot drawing to show that Bill was right.

8. What basic division fact would you use to find how many 6's there are in 34?

9. If you know $\begin{array}{r} 8 \\ 4\overline{)32} \end{array}$, what related basic division fact do you also know?

10. Use the numbers 5, 9, and 45. Write two related basic multiplication facts and two related basic division facts.

11. Draw a picture to show the meaning of this statement: 25 equals eight 3's and 1 left over.

12. In Joe's division, how did he get the 24 that he subtracted?

JOE

$$\begin{array}{r} 5\boxed{?} \\ 3\overline{)174} \\ -15 \\ \hline 24 \\ -24 \\ \hline \end{array}$$

Helping Yourself

Do you know your basic multiplication and division facts?

1. With the numbers 4, 9, and 36, you can make two pairs of related facts. For each fact give the number that belongs in place of the question mark. (70, 96)

$$\overbrace{\underbrace{\begin{array}{r}4\\ \times 9\\ \hline 36\end{array}\qquad\begin{array}{r}\boxed{?}\\ \times 4\\ \hline 36\end{array}}\qquad\underbrace{\begin{array}{r}\boxed{?}\\ 9\overline{)36}\end{array}\qquad\begin{array}{r}9\\ 4\overline{)\boxed{?}\boxed{?}}\end{array}}}$$

For each set of numbers below, write a pair of multiplication facts and a pair of division facts.

2. 6, 4, 24   7, 3, 21

3. 8, 5, 40   2, 9, 18

4. 3, 9, 27   4, 3, 12

Do you know how to divide when there is no remainder?

5. $5\overline{)455}$ $6\overline{)186}$ $7\overline{)287}$ (101)

6. $4\overline{)844}$ $2\overline{)628}$ $3\overline{)939}$ (102)

Do you know the basic facts to use in uneven division? (97-100)

7. For each of the following division questions, write the basic division fact you must think to find your first quotient figure. (97-100)

$6\overline{)35}$ $7\overline{)33}$ $5\overline{)31}$ $4\overline{)19}$

8. Use a number line. Show what the left-over part will be when you divide 26 by 7. (97)

If you have no remainder, how can you check your division? (103)

Copy. Find the quotients. Check.

9. $6\overline{)378}$ $4\overline{)368}$ $3\overline{)399}$ $3\overline{)183}$

Do you know where to place the first quotient figure when you divide? Explain why these quotient figures are placed as they are here.

10. $\begin{array}{r}4\\ 2\overline{)824}\end{array}$ $\begin{array}{r}8\\ 4\overline{)328}\end{array}$ $\begin{array}{r}5\\ 5\overline{)260}\end{array}$ (103)

Which of these divisions will have a remainder? (97)

11. $6\overline{)25}$ $4\overline{)85}$ $3\overline{)963}$ $2\overline{)11}$

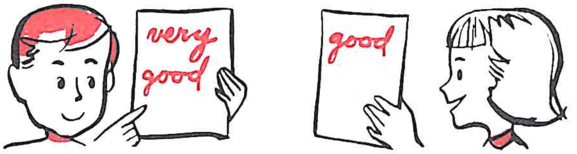
12. Write a number that means 46 tens and 4 ones. (102)

In each of the following divisions, the tens have been divided. Tell how many ones there are to be divided in each example. (103)

13. $\begin{array}{r}5\boxed{?}\\ 5\overline{)275}\\ -25\\ \hline\end{array}$ $\begin{array}{r}8\boxed{?}\\ 4\overline{)340}\\ -32\\ \hline\end{array}$ $\begin{array}{r}1\boxed{?}\\ 3\overline{)57}\\ -3\\ \hline\end{array}$ $\begin{array}{r}3\boxed{?}\\ 7\overline{)245}\\ -\boxed{?}\boxed{?}\\ \hline\end{array}$

14. Make a dot drawing to show $\frac{1}{5}$ of $20 = 4$. (94)

How Well Are You Doing?



This is your opportunity to show that you know the work studied in Unit Four. Read carefully. Think until you find the answers. Then write answers only.

1. What is the first quotient figure when you divide 390 by 5?

2. When you divide 24 by 6, do you write your quotient figure in tens place or in ones place?

3. In what place will you write the first quotient figure in this division? $2\overline{)286}$

4. In what place will you write the first quotient figure when you do this division? $4\overline{)368}$

5. How many tens do you think when you do this division? $5\overline{)480}$

6. After you divide the tens in this example, how many ones do you have to divide?

$$\begin{array}{r} 5 \\ 7\overline{)364} \\ 35 \\ \hline \boxed{?} \end{array}$$

7. Jim had 40 goldfish. He divided them equally among some boys. Each boy got $\frac{1}{5}$ of the fish. How many boys got fish?

8. Jack has 36 magazines to deliver. He delivered $\frac{1}{4}$ of them before he went to school. How many magazines did he deliver?

9. Jerry wants to divide 12 candy bars equally among 3 children. What part of the candy bars will each child receive?

10. Joan bought a package of 48 cookies. If she put the cookies into two equal packages, how many cookies will there be in each package?

11. Mrs. Smith wants to serve 15 cupcakes. If cupcakes are sold in packages of 3 cupcakes, how many packages should she buy?

12. A dealer put 98 pounds of grass seed into 3-pound bags. How many bags did he fill?

13. Jack needs 12 boards to make 1 box. How many boards will he need to make 4 boxes?

14. Sue walks 5 blocks to school. Ann walks 3 times as far as Sue. How many blocks does Ann walk?

15. Bill had 30 papers to arrange on the bulletin board. He put 5 papers in each row. How many rows were there?

16. In the school band there are 12 girls and 21 boys. How many children are there in the band?

UNIT FIVE

Division Facts for 6

Roses are brought into the flower shop in bunches of 4 dozen. There are 48 roses in a large bunch. Frank has to separate each large bunch into small bunches of 6 roses each.

1. How many bunches of 6 roses each can be made from a large bunch of 48 roses? Explain how you can use the number line at the bottom of the page to check your answer.

2. How would you use the number line below to find how many 6's = 30?

3. Use the number line below to find how many 6's = 42. To find how many 6's = 12.

Find the answer to these division questions for 6 by using subtraction.

4. How many 6's equal 30?

5. How many 6's equal 54?

6. How many 6's equal 24?

7. Joe checked his answer to this division question by multiplying. What numbers were multiplied to get the second 12?

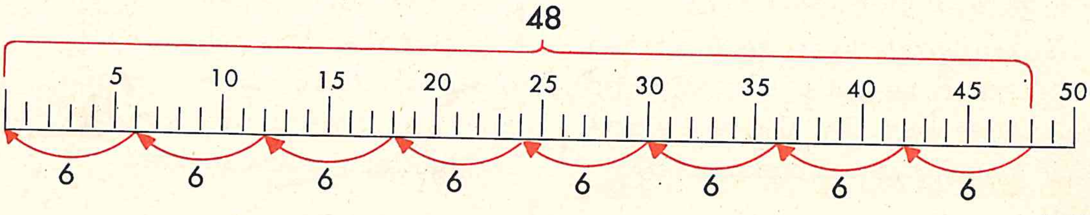
JOE

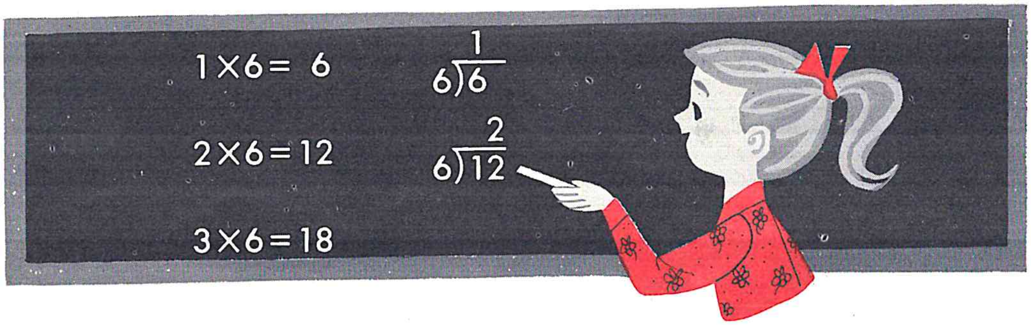
$$\begin{array}{r} 2 \\ 6\overline{)12} \\ -12 \\ \hline 0 \end{array}$$

▶ Find the answers to these questions. Check by multiplying as Joe did.

8. $6\overline{)24}$ $6\overline{)54}$ $6\overline{)30}$ $6\overline{)18}$

9. $6\overline{)12}$ $6\overline{)36}$ $6\overline{)42}$ $6\overline{)48}$





Studying Division Facts for 6

In the picture above, Joan is using the multiplication table for 6's to help her write the division facts for 6.

1. The product of a multiplication fact becomes what part of the related division fact?

2. What part of the multiplication fact becomes the quotient in the related division fact?

3. Write all the basic multiplication facts for 6's. Beside each fact, write a basic division fact for 6's, as Joan is doing.

Dividing by 6

1. Don divided 48 peanuts equally among 6 children. What part of the peanuts did each child get? How many peanuts did Don give each child?

■ **To find $\frac{1}{6}$ of a number, divide the number by 6.**

2. How many peanuts would Don give each of the 6 children if Don had 36 peanuts? 24? 42?

3. Jim wants to make 6 garden markers. If he cut a strip of wood 42 inches long into 6 equal parts, how long would each marker be?

4. Jim pulled 48 beets from his garden. He was tying them in bunches of 6 beets each. After he had tied 5 bunches, he said he had counted backwards by 6's and he knew he had 18 beets left to tie. Write the numbers Jim said as he counted backwards by 6's.

5. Sue had 38 cakes. She wanted to give the same number of cakes to each of 6 children. Give the basic division fact she thought as she divided.

SUE

$$\begin{array}{r} 6,\ r\ 2 \\ 6\overline{)38} \\ \underline{36} \\ 2 \end{array}$$

Helper Table for Dividing by 6

1. Here are some divisions that these children began. Copy the examples and finish the work.

BETTY

$$\begin{array}{r} 8, \text{ r} \\ 6\overline{)52} \\ -48 \end{array}$$

TOM

$$\begin{array}{r} 5, \text{ r } 5 \\ 6\overline{)35} \end{array}$$

JACK

$$\begin{array}{r} 6 \\ 6\overline{)40} \end{array}$$

2. Which child used the basic division fact $36 \div 6 = 6$?

3. What basic division fact did Tom use? How could he tell that he would have a remainder?

Copy. Divide. If you do not know the basic fact helper, the table below will help you. That is, think back to the nearest basic division fact for dividing by 6.

4. $6\overline{)55}$ $6\overline{)29}$ $6\overline{)33}$ $6\overline{)14}$
5. $6\overline{)57}$ $6\overline{)44}$ $6\overline{)8}$ $6\overline{)20}$
6. $6\overline{)41}$ $6\overline{)29}$ $6\overline{)23}$ $6\overline{)49}$
7. $6\overline{)37}$ $6\overline{)21}$ $6\overline{)34}$ $6\overline{)59}$
8. $6\overline{)14}$ $6\overline{)47}$ $6\overline{)51}$ $6\overline{)10}$
9. $6\overline{)33}$ $6\overline{)9}$ $6\overline{)15}$ $6\overline{)25}$
10. $6\overline{)16}$ $6\overline{)43}$ $6\overline{)56}$ $6\overline{)17}$

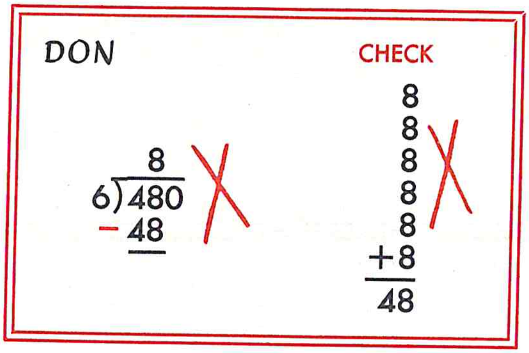
TABLE FOR DIVIDING BY 6

sic Fact Helper	$\begin{array}{r}1\\6\overline{)6}\end{array}$	$\begin{array}{r}2\\6\overline{)12}\end{array}$	$\begin{array}{r}3\\6\overline{)18}\end{array}$	$\begin{array}{r}4\\6\overline{)24}\end{array}$	$\begin{array}{r}5\\6\overline{)30}\end{array}$	$\begin{array}{r}6\\6\overline{)36}\end{array}$	$\begin{array}{r}7\\6\overline{)42}\end{array}$	$\begin{array}{r}8\\6\overline{)48}\end{array}$	$\begin{array}{r}9\\6\overline{)54}\end{array}$
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
divide ese numbers 6, think back the basic ct above.	7 8 9 10 11	13 14 15 16 17	19 20 21 22 23	25 26 27 28 29	31 32 33 34 35	37 38 39 40 41	43 44 45 46 47	49 50 51 52 53	55 56 57 58 59

Showing Tens and Ones in Quotients

Don said, "I found an easy way to divide 480 by 6. I just cover up the zero and think: $6\overline{)48}$."

1. Don then put the division below on the board. The teacher marked it wrong. Then Don checked his work to show that it was right. What did he find out?

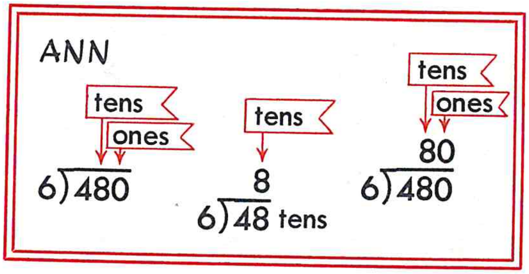


2. What could you tell Don to help him?

▶ Copy. Divide. Check by adding.

3. $6\overline{)240}$ $6\overline{)540}$ $6\overline{)420}$

Ann said, "When I divide, I think of a place for tens and a place for ones in my quotient." She wrote this.



Use figures only. Write these divisions.

4. 36 tens ÷ 6 = ☐ tens

5. 12 tens ÷ 3 = ☐ tens

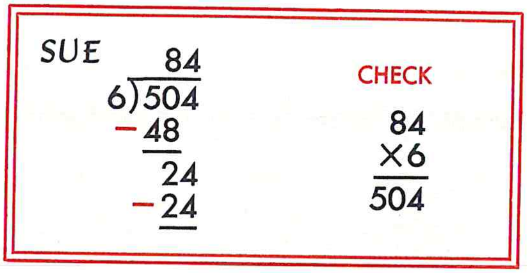
6. 32 tens ÷ 8 = ☐ tens

7. 24 tens and 9 ones ÷ 3 = ☐ tens and ☐ ones

8. 42 tens and 6 ones ÷ 6 = ☐ tens and ☐ ones

9. 11 tens and 5 ones ÷ 5 = ☐ tens and ☐ ones

10. 19 tens and 2 ones ÷ 6 = ☐ tens and ☐ ones



11. In Sue's division, how many tens were divided? After dividing the tens by 6, how many tens were left over? How did Sue get the 4 ones that she wrote in her quotient? Explain Sue's check.

▶ Copy. Find the quotients. Check by multiplying.

12. $6\overline{)594}$ $3\overline{)291}$ $8\overline{)360}$

13. $7\overline{)378}$ $5\overline{)475}$ $4\overline{)172}$

A Test Reviewing Division

Copy. Find the answers.

1. $45 \div 9$ $48 \div 8$ $42 \div 7$
2. $\frac{1}{2}$ of 260 $\frac{1}{4}$ of 240 $\frac{1}{6}$ of 36
3. $4\overline{)84}$ $3\overline{)396}$ $5\overline{)255}$
4. $3\overline{)96}$ $8\overline{)328}$ $4\overline{)324}$
5. $7\overline{)29}$ $5\overline{)16}$ $7\overline{)301}$
6. $4\overline{)296}$ $3\overline{)195}$ $2\overline{)118}$
7. $5\overline{)205}$ $2\overline{)174}$ $6\overline{)504}$
8. $6\overline{)126}$ $8\overline{)256}$ $9\overline{)567}$
9. $2\overline{)642}$ $5\overline{)150}$ $9\overline{)288}$
10. $3\overline{)240}$ $6\overline{)258}$ $7\overline{)455}$

Answers Only

1. How many 6's equal 30?

2. How many tens equal 300?

3. How many 6's equal 300?

4. If you know that $24 \div 6 = 4$, then you know that $240 \div 6 = \square$.

5. If you are dividing by 5 and you have a remainder of 5 or more, is your quotient correct? Explain your answer.

6. What is the largest remainder you can have when you are dividing by 6?

7. How many tens do you divide when you divide 184 by 2?

8. How many tens do you have left over when you divide the tens in 270 by 5?

9. What basic division fact do you use when you divide 29 by 8?

10. Jerry made 6 equal rows from 27 stamps. How many stamps did he have left over?

11. Bill divided 45 airplane pictures equally among 5 children. How many pictures did each child get?

12. Ann says it takes her 4 minutes to read a page in her storybook. How many pages can she read in 40 minutes?

13. How many 3-cent stamps can Joe buy if he has 15 cents?

14. Betty put 6 cookies into each bag. How many bags can she fill from a box of 48 cookies?

15. There were 42 persons going on a trip to the art museum. How many automobiles did they need if 6 persons rode in each car?

16. How many 5-cent pieces can Jack get if he has 45 pennies?

Dividing and Checking

The teacher asked Carl and Ruth to answer the division question

$$\begin{array}{r}\boxed{?}\\6\overline{)94}\end{array}$$

1. Explain Ruth's way of finding the quotient and remainder.

RUTH	CARL
$\begin{array}{r}15,\ r\ 4\\6\overline{)94}\\-\underline{60}\\34\\-\underline{30}\\4\end{array}$	$\begin{array}{r}15,\ r\ 4\\6\overline{)94}\\-\underline{6}\\34\\-\underline{30}\\4\end{array}$

2. What makes Carl's way shorter than Ruth's way?

3. How can you tell that the 6 that Carl subtracted means 6 tens, or 60?

At first, Carl was not sure that his quotient was correct. He used the check below to find if his quotient and remainder were right.

CARL

CHECK $\begin{array}{r}15\\\times\underline{6}\\90\\+\underline{4}\\94\end{array}$

4. What would Carl have written as a check if he wanted to check his quotient and remainder in the following division example?

$$\begin{array}{r}19,\ r\ 2\\5\overline{)97}\\-\underline{5}\\47\\-\underline{45}\\2\end{array}$$

5. Make up a rule for checking your division when you have a remainder.

▶ Copy. Use the shorter way and find the answers. Check your answers the way Carl did.

6. $5\overline{)89}$ $4\overline{)75}$ $3\overline{)56}$ $6\overline{)95}$
7. $4\overline{)78}$ $3\overline{)83}$ $5\overline{)97}$ $4\overline{)59}$
8. $3\overline{)47}$ $2\overline{)99}$ $6\overline{)88}$ $3\overline{)77}$
9. $5\overline{)76}$ $6\overline{)75}$ $4\overline{)51}$ $6\overline{)83}$
10. $6\overline{)207}$ $5\overline{)348}$ $3\overline{)295}$
11. $6\overline{)412}$ $4\overline{)317}$ $6\overline{)259}$
12. $5\overline{)469}$ $6\overline{)454}$ $6\overline{)563}$
13. $8\overline{)178}$ $7\overline{)374}$ $8\overline{)435}$
14. $5\overline{)428}$ $8\overline{)291}$ $7\overline{)458}$
15. $6\overline{)329}$ $5\overline{)377}$ $7\overline{)239}$

Choosing the Best Way to Divide

Of the 1000 tickets printed for the school picture show, 792 were not yet sold. Jack thought it would be a good idea to divide the 792 tickets equally among the 6 highest classes. He said each class would have only 132 tickets to sell.

He told Alice that this is how he figured.

I. Divide the hundreds.

$$\begin{array}{r} 100 \\ 6\overline{)792} \\ -600 \\ \hline 192 \end{array}$$

II. Divide the tens.

$$\begin{array}{r} 30 \\ 6\overline{)192} \\ -180 \\ \hline 12 \end{array}$$

III. Divide the ones.

$$\begin{array}{r} 2 \\ 6\overline{)12} \\ -12 \\ \hline 0 \end{array}$$

$100+30+2=132$

Ann and Tom said that Jack divided correctly, but that his way was too long. Then Ann and Tom showed Jack another way to divide.

ANN

$$\begin{array}{r} 132 \\ 6\overline{)792} \\ -600 \\ \hline 192 \\ -180 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

TOM

$$\begin{array}{rccc} & 1 & 3 & 2 \\ \cline{2-4} 6) & 7 & 9 & 2 \\ - & 6 & & \\ \cline{2-2} & 1 & 9 & \\ - & 1 & 8 & \\ \cline{2-3} & & 1 & 2 \\ - & & 1 & 2 \\ \cline{3-4} & & & 0 \end{array}$$

1. Why is Tom's way better than Ann's? How is Tom's way different from Ann's? Is it like Ann's division in some ways?

2. How did Tom show that the 1 in his quotient means 100? What does the 3 in his quotient mean? How can you tell?

▶ Copy. Divide, using Tom's way.

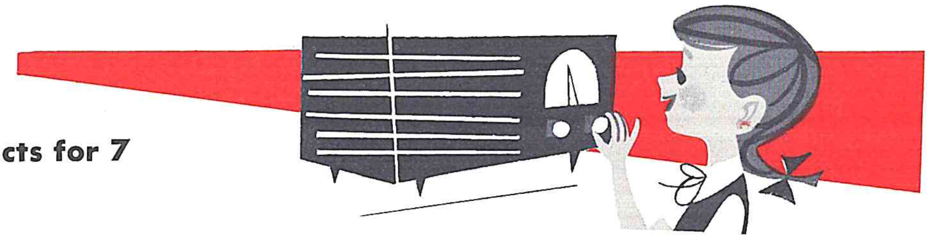
3. $5\overline{)935}$ $6\overline{)870}$ $3\overline{)561}$

4. $4\overline{)796}$ $3\overline{)876}$ $6\overline{)942}$

5. $7\overline{)945}$ $2\overline{)596}$ $5\overline{)915}$

6. $6\overline{)756}$ $8\overline{)912}$ $4\overline{)692}$

Division Facts for 7



1. A radio report stated that a hunting party had been lost for 35 days. To find how many weeks the party was lost, is it best to subtract 7's from 35, to multiply 7's, or to divide 35 by 7?

2. Could addition be used to find how many 7's = 35? Show what you mean.

Most of the following division questions you have answered before. If you are not sure of an answer, use subtraction to find it.

3. $7\overline{)49}$ $7\overline{)28}$ $7\overline{)56}$ $7\overline{)42}$

4. $7\overline{)14}$ $7\overline{)35}$ $7\overline{)21}$ $7\overline{)63}$

5. Show with a number line that $21 \div 7 = 3$.

Use folded paper to cover the answers to the facts below. Write what you think is the answer. Then move the paper to see whether your answer is right.

6. $\begin{array}{r}8\\7\overline{)56}\end{array}$ $\begin{array}{r}2\\7\overline{)14}\end{array}$ $\begin{array}{r}5\\7\overline{)35}\end{array}$ $\begin{array}{r}4\\7\overline{)28}\end{array}$

7. $\begin{array}{r}6\\7\overline{)42}\end{array}$ $\begin{array}{r}9\\7\overline{)63}\end{array}$ $\begin{array}{r}7\\7\overline{)49}\end{array}$ $\begin{array}{r}3\\7\overline{)21}\end{array}$

8. Study the facts in rows 6 and 7. Use the read-and-think way (page 88).

9. Write the basic multiplication facts for 7's. Beside each multiplication fact write the basic division fact that goes with it, like this.

$1 \times 7 = 7$	$7 \div 7 = 1$
$2 \times 7 = 14$	$14 \div 7 = 2$
$3 \times 7 = 21$	$21 \div 7 = 3$
$4 \times 7 = 28$	

10. Draw 14 marbles. Put a ring around $\frac{1}{7}$ of them.

11. Mary divided 63 pennies into 7 equal stacks. How many pennies were there in each stack?

12. Jim earned 35¢. He said he was going to spend $\frac{1}{7}$ of his money each day of the next week. How much did he spend each day?

13. Which is more, $\frac{1}{7}$ of 49¢, or $\frac{1}{4}$ of 28¢?

14. There are 7 persons eating breakfast. Mother made 28 pancakes. If each person eats $\frac{1}{7}$ of the pancakes, how many will each person eat?

Using the Basic Division Facts for 7

There were 65 cards in a spelling game that 7 children were playing. Each of the 7 players was to get the same number of cards.

After Bob gave each player his cards, he said, "I think I made a mistake. I have 2 cards left over."

1. Give the basic division fact that will help Bob.

2. How many cards did each player get?

3. Use addition and show that seven 9's + 2 = 65.

4. Can you think of a shorter check than the one used in example 3?

5. Jim's father uses about 7 gallons of gasoline each working day. How many whole working days will 60 gallons last? How many gallons will be left over?

6. Explain how Jim checked his answer to example 5. The table below may help you.

$$\begin{array}{r} 8\\ \times 7\\ \hline 56\\ +4\\ \hline 60 \end{array}$$

JIM

Copy. Divide. The table below can help you. Check your answers, using Jim's way.

7. $7\overline{)44}$ $7\overline{)38}$ $7\overline{)55}$ $7\overline{)69}$

8. $7\overline{)31}$ $7\overline{)48}$ $7\overline{)26}$ $7\overline{)19}$

TABLE FOR DIVIDING BY 7

sic Fact lelper	$\begin{array}{r}1\\7\overline{)7}\end{array}$	$\begin{array}{r}2\\7\overline{)14}\end{array}$	$\begin{array}{r}3\\7\overline{)21}\end{array}$	$\begin{array}{r}4\\7\overline{)28}\end{array}$	$\begin{array}{r}5\\7\overline{)35}\end{array}$	$\begin{array}{r}6\\7\overline{)42}\end{array}$	$\begin{array}{r}7\\7\overline{)49}\end{array}$	$\begin{array}{r}8\\7\overline{)56}\end{array}$	$\begin{array}{r}9\\7\overline{)63}\end{array}$
divide these mbers by 7, nk back to basic fact ove.	8	15	22	29	36	43	50	57	64
	9	16	23	30	37	44	51	58	65
	10	17	24	31	38	45	52	59	66
	11	18	25	32	39	46	53	60	67
	12	19	26	33	40	47	54	61	68
	13	20	27	34	41	48	55	62	69

Dividing and Checking

1. The teacher asked the class to tell her how they make sure that their answers in division are correct. What would you have told the teacher?

2. Jerry said, "When there is no remainder, I use the check we learned on page 103." Explain this check.

▶ Copy. Find the answers. Check as Jerry suggested.

3. $7\overline{)357}$ $6\overline{)144}$ $5\overline{)325}$
4. $4\overline{)172}$ $6\overline{)594}$ $7\overline{)245}$
5. $6\overline{)450}$ $7\overline{)588}$ $5\overline{)145}$
6. $7\overline{)497}$ $7\overline{)455}$ $3\overline{)297}$

Jane said, "I always check to see that my remainder is smaller than my divisor."

7. Which of these children did not use Jane's check? Explain.

ANN

$$\begin{array}{r} 69, \text{ r } 3 \\ 7\overline{)486} \\ -\ 42 \\ \hline 66 \\ -\ 63 \\ \hline 3 \end{array} \quad ?$$

JACK

$$\begin{array}{r} 97, \text{ r } 8 \\ 6\overline{)590} \\ -\ 54 \\ \hline 50 \\ -\ 42 \\ \hline 8 \end{array} \quad ?$$

▶ Copy. Divide. Each time you subtract, check your remainder as Jane suggests.

8. $2\overline{)157}$ $5\overline{)466}$ $4\overline{)257}$
9. $6\overline{)495}$ $7\overline{)258}$ $6\overline{)199}$
10. $7\overline{)508}$ $5\overline{)179}$ $4\overline{)295}$
11. $7\overline{)513}$ $7\overline{)586}$ $8\overline{)334}$

Jim said, "If you are sure that your remainders are correct, there is a good rule for checking your quotient." He gave the rule below.

■ **To check a division example with a remainder, multiply the quotient and the divisor together. Add the remainder. The sum you get is equal to the dividend in the problem.**

▶ Copy. Divide. Check each remainder. Then use Jim's way and check your answer.

12. $9\overline{)294}$ $8\overline{)357}$ $6\overline{)195}$
13. $7\overline{)386}$ $8\overline{)170}$ $9\overline{)483}$
14. $8\overline{)255}$ $7\overline{)681}$ $5\overline{)384}$
15. $3\overline{)295}$ $6\overline{)581}$ $7\overline{)590}$

The Poe School received 500 tulip bulbs. The teacher said each class would get $\frac{1}{6}$ of the bulbs to

plant in window boxes. She asked Ruth to find how many bulbs her class would get.

16. Ruth's division is marked wrong. How could Ruth have told that her last quotient figure was wrong?

RUTH

$$\begin{array}{r} 82,\ \mathrm{r}\ 8 \\ 6\overline{)500} \\ -48 \\ \hline 20 \\ -12 \\ \hline 8 \end{array} \quad ✗$$

CHECK

$$\begin{array}{r} 82 \\ \times 6 \\ \hline 492 \\ +8 \\ \hline 500 \end{array} \quad ✗$$

17. Ruth's check is marked wrong. Yet the sum in her check is the same as the dividend in her division. Does this always prove that your quotient is correct?

If you cannot answer this question, read again what Jim said before he gave his rule for checking on page 118.

18. Find the correct quotient for Ruth's division example.

19. Joe's stamp club collected 942 stamps. Joe wanted to divide the stamps equally among 6 members. How many times did he subtract to find his answer? Did he have the right remainder each time he subtracted?

JOE

$$\begin{array}{r} 157 \\ 6\overline{)942} \\ -6 \\ \hline 34 \\ -30 \\ \hline 42 \\ -42 \\ \hline \end{array}$$

CHECK

$$\begin{array}{r} 157 \\ \times 6 \\ \hline 942 \end{array}$$

20. After Joe subtracted the first time, what number did he bring down?

21. Joe said he had two bring down steps. What did he mean?

22. Ann said that Joe had three subtraction steps and two bring down steps. What did she mean?

▶ Copy. Divide. Use the steps that Joe used. Keep checking as you work.

23. $5\overline{)875}$ $4\overline{)972}$ $3\overline{)858}$

24. $6\overline{)798}$ $7\overline{)896}$ $6\overline{)882}$

25. $7\overline{)875}$ $6\overline{)984}$ $5\overline{)895}$

26. $7\overline{)903}$ $8\overline{)928}$ $4\overline{)992}$

Measuring Improvement—Test 5

This test will help you measure how well you are learning your arithmetic.

Begin when the teacher tells you.

Work until the teacher gives you the signal to stop.

Write the answers for these examples on folded paper.

1. $6\overline{)48}$ $7\overline{)56}$ $8\overline{)40}$
2. $8\overline{)32}$ $5\overline{)45}$ $6\overline{)54}$
3. $9\overline{)27}$ $7\overline{)28}$ $9\overline{)36}$
4. $6\overline{)42}$ $8\overline{)56}$ $7\overline{)49}$
5. $7\overline{)42}$ $3\overline{)24}$ $5\overline{)35}$

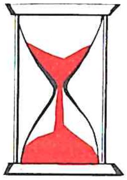
Copy these examples. Find the answers. Watch the signs.

6. $6\overline{)360}$ $5\overline{)315}$ $3\overline{)894}$

7. $\begin{array}{r} 603 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 4732 \\ +6689 \\ \hline \end{array}$ $\begin{array}{r} 5000 \\ -95 \\ \hline \end{array}$

8. $\begin{array}{r} 126 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 896 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 675 \\ \times 7 \\ \hline \end{array}$

9. $\begin{array}{r} \$5.75 \\ -.38 \\ \hline \end{array}$ $\begin{array}{r} \$9.18 \\ -3.69 \\ \hline \end{array}$ $\begin{array}{r} \$1.84 \\ +.95 \\ \hline \end{array}$



10. $4\overline{)2972}$ $6\overline{)97}$ $7\overline{)875}$

11. \$.50+\$1.64+\$4.83+\$.04

12. Subtract \$6.42 from \$10.06.

At the top of your paper, write the number of correct answers that you have, the number of minutes that you worked, and the date. Call this paper "Improvement Test 5." Keep this test in your arithmetic notebook.

Look at the improvement tests that you have in your notebook. Do your tests show that you are improving?

Some Special Helps

1. Did you get all the answers correct for the division questions in rows 1-5 in the test on this page? If you made mistakes, study pages 109 and 116.

2. If your test shows that you need help with other division questions, study pages 111, 112, 114, and 115.

3. If you made mistakes in adding or subtracting money numbers, study pages 21 and 23.

1 DOZ.
1 DOZ.
1 DOZ.
1 DOZ.
1 DOZ.
1 DOZ.

Division Facts for 8

Gary and Carol are getting strings of lights ready for a Christmas tree. Each string needs 8 light bulbs. Gary wants to know how many strings 72 bulbs will fill.

1. Carol said, "I can find the answer by thinking how many light bulbs will be left each time we fill a string."

Look at Carol's work and tell how many 8's equal 72.

2. Explain how the number line below helps you to find how many 8's equal 72.

CAROL

$$\begin{array}{r} 72 \\ -8 \\ \hline 64 \\ -8 \\ \hline 56 \\ -8 \\ \hline 48 \\ -8 \\ \hline 40 \\ -8 \\ \hline 32 \\ -8 \\ \hline 24 \\ -8 \\ \hline 16 \\ -8 \\ \hline 8 \end{array}$$

3. Use the number line below to find how many 8's = 64.

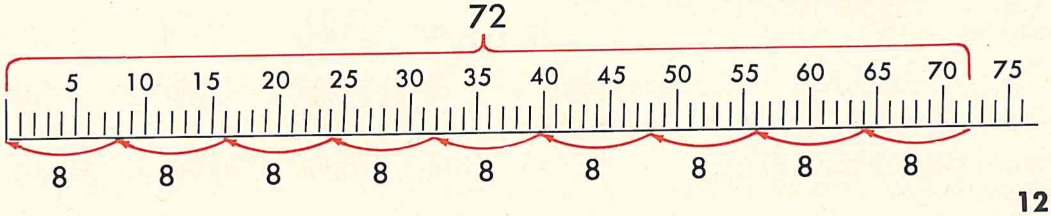
4. Write a basic multiplication fact that will help you answer this division question: 56 ÷ 8 = ☐.

From each multiplication fact at the left below, find the answer to the division question that follows it.

5. 4 × 8 = 32 32 ÷ 8 = ☐
6. 6 × 8 = 48 48 ÷ 8 = ☐
7. 3 × 8 = 24 24 ÷ 8 = ☐
8. 5 × 8 = 40 40 ÷ 8 = ☐

Give the quotients quickly.

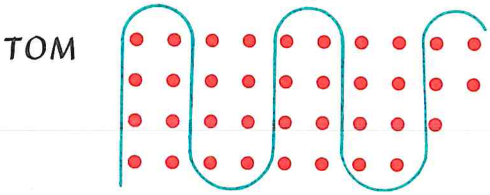
9. $8\overline{)64}$ $8\overline{)40}$ $8\overline{)24}$ $8\overline{)72}$
10. $8\overline{)56}$ $8\overline{)16}$ $8\overline{)48}$ $8\overline{)32}$



Dividing by 8

The 37 children in Tom's class were getting ready for a square dance. Tom said, "I don't see how all the children can be in the dance. There are 8 children to a set of dancers. I think some children will be left over."

1. Explain how this drawing shows that Tom was right.



Ann said, "I can tell some children will be left over without making a drawing like Tom's. I know that 37 is not one of the numbers I say when I count by 8's."

2. Write the numbers that Ann had in mind.

3. Which of Ann's numbers helps you to find how many 8's and how much more equal 37?

4. Show all the work for answering the division question $37 \div 8 = \square$.

Ellen baked 60 cookies for a church festival. She had 8 paper bags. She wanted to put the same number of cookies into each bag.

5. Give the basic division fact that helped Ellen know how many cookies to put into a bag. How many cookies will be left over?

▶ Copy. Find the quotients and remainders. Use the table at the top of the next page if you need help.

6. $8\overline{)54}$ $8\overline{)79}$ $8\overline{)46}$

7. $8\overline{)336}$ $8\overline{)424}$ $8\overline{)785}$

8. $8\overline{)193}$ $8\overline{)688}$ $8\overline{)296}$

9. $8\overline{)472}$ $8\overline{)755}$ $8\overline{)313}$

10. $8\overline{)586}$ $8\overline{)656}$ $8\overline{)616}$

TABLE FOR DIVIDING BY 8

Basic Fact Helper	$\begin{array}{r}1\\8\overline{)8}\end{array}$	$\begin{array}{r}2\\8\overline{)16}\end{array}$	$\begin{array}{r}3\\8\overline{)24}\end{array}$	$\begin{array}{r}4\\8\overline{)32}\end{array}$	$\begin{array}{r}5\\8\overline{)40}\end{array}$	$\begin{array}{r}6\\8\overline{)48}\end{array}$	$\begin{array}{r}7\\8\overline{)56}\end{array}$	$\begin{array}{r}8\\8\overline{)64}\end{array}$	$\begin{array}{r}9\\8\overline{)72}\end{array}$
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
To divide these numbers by 8, think back to the basic fact above.	9 10 11 12 13 14 15	17 18 19 20 21 22 23	25 26 27 28 29 30 31	33 34 35 36 37 38 39	41 42 43 44 45 46 47	49 50 51 52 53 54 55	57 58 59 60 61 62 63	65 66 67 68 69 70 71	73 74 75 76 77 78 79

Gary and Sue made and wrapped 917 pieces of coconut candy. They decided to put 8 pieces into each bag. How many bags did they use? How many pieces of candy were left over?

SUE

$$\begin{array}{r} 114,\ \text{r } 5\\ 8\overline{)917}\\ -8\\ \hline 11\\ -8\\ \hline 37\\ -32\\ \hline 5\end{array}$$

11. What basic division fact did Sue think when she found the second quotient figure? The third quotient figure?

12. Why did Sue write her first quotient figure above the 9 in 917?

13. Joan has 960 paper napkins to divide into packages of 8 napkins each. She says she will have 12 packages. What is her mistake?

▶ Copy. Find the quotients.

14. $8\overline{)937}$ $8\overline{)998}$ $8\overline{)957}$

15. $8\overline{)908}$ $8\overline{)986}$ $8\overline{)927}$

16. $8\overline{)975}$ $8\overline{)918}$ $8\overline{)960}$

Understanding the Meaning of Fractions

Jean said, "I must use about a fourth of a stick of butter for this much popcorn."

Don had been watching Jean. Don said, "You made only 3 marks on the stick of butter. If you cut the stick that way, you will cut off only a third of the stick."

"No, I will have a fourth," said Jean.

1. Which of the children was right?

2. Draw a stick of candy like this: . Make marks in color on the drawing to show the stick of candy divided into fourths. How many marks in color did you make?

Jack had a full can of cat food. Jack said, "Father, is this enough food to give my cat?"

Father said, "A third of a can will be enough."

3. How can Jack measure a third of a can?

4. If a can is only one third full of food, what fraction of the can is empty? Make a drawing and show the filled third and the empty thirds of the can. How many thirds are there in the whole can?

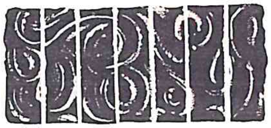
5. A large candy bar is to be divided equally among six boys. What part of the bar will be each boy's share?

🟥 **When any amount, such as a candy bar, is divided into equal parts, each part is a fraction of the whole amount.**

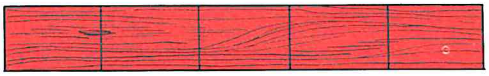
6. Try to make a rule for naming the fractions when an amount is divided into equal parts.

Test your rule for naming fractions when an amount has been divided into equal parts by answering the following questions.

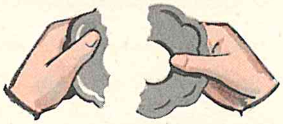
7. Into how many parts has the cake below been divided? Each part is what fraction of the cake?



8. Into how many parts has this board been divided? Each part is what fraction of the board?

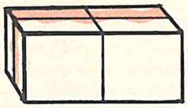


9. Carol wanted to give $\frac{1}{2}$ of her cookie to Bob. She broke her cookie into two parts. Look at the picture below. If Carol gives one part to Bob, can you say she gave him exactly $\frac{1}{2}$ of her cookie? Give a reason for your answer.

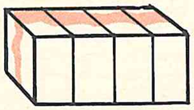


10. Mary and Jim had a brick of ice cream to share. Just as Mary cut the brick into halves, Ann and Tom came along. Mary and Jim wanted to share the ice cream with them. If each child gets an equal share of the ice cream, what part of the brick will each child get?

A.

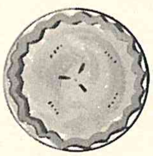


B.

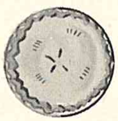


11. Mary said the brick of ice cream had to be cut as shown in picture A. Jim said Mary should cut the brick as shown in picture B. What do you think about this? Give a reason for your answer.

C.



D.

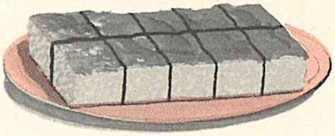


12. Jerry had $\frac{1}{4}$ of pie C. Joan had $\frac{1}{4}$ of pie D. Did the two children have the same amount of pie? Give a reason for your answer.

13. Denny had 30¢. He said, "I will give you $\frac{1}{5}$ of my money." Don had 15¢. He said, "I will give you $\frac{1}{5}$ of my money." Give a quick way in which you can tell which boy will give you the larger amount of money. Draw dot pictures to show that your answer was right.

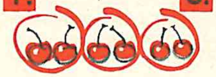
14. Sue and Sally each took a piece of cake from the plate below. Together they took what part of the cake? How many pieces did they leave on the plate? What part of the whole cake did they leave?

E.

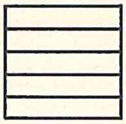


15. Which of the following pictures show either a whole or a group of things divided into thirds? Into fifths?

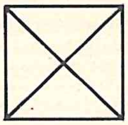
F.



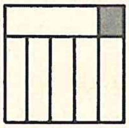
G.



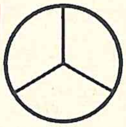
H.



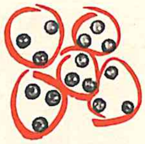
I.



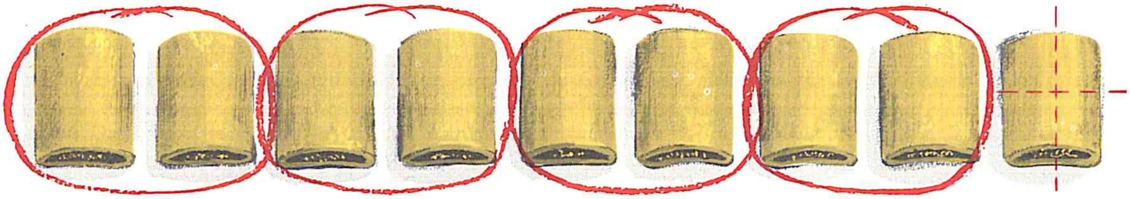
J.



K.



16. Can you say that the shaded part in picture I is $\frac{1}{7}$ of the whole? Give a reason for your answer.



Using Fractions

1. Four boys on a long hike became very hungry. They had only 9 fig-bar cookies. They wanted to divide them equally.

Tom said, "I know each of us will get at least two whole fig bars." What basic division fact did Tom use to decide this?

2. How many fig bars would have to be divided into fractions to give each boy his share of the fig-bar cookies? Into what size fractions should the left-over cookie be divided?

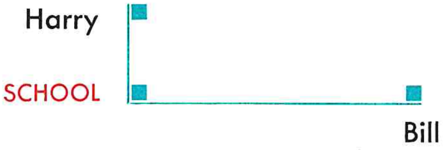
3. One of the boys said, "I want only two cookies. The three of you can divide the left-over cookie." Into what size fractions should the left-over cookie now be divided? Make a drawing showing how the left-over cookie was divided.

4. Mrs. Smith was packing a sack of lunch for each of 8 boys. She had a 16-ounce can of salted peanuts. What part of the peanuts should she put into each sack if each boy gets the same amount?

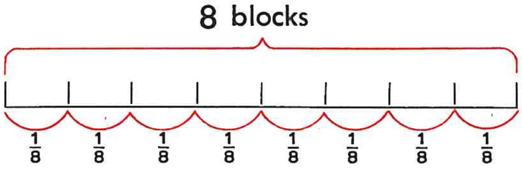
5. Betty measured a third of a cup of sugar. Nancy said, "Are you sure that is a third of a cup? The cup is not even half full, and 3 is larger than 2."

Can you tell what Nancy was referring to when she said that 3 is larger than 2?

6. Bill said to Harry, "You live only a third as far from school as I do." Look at the picture below. How could you find out if Bill's statement is correct?



7. Ann lives 8 blocks from school. This morning she rode 3 blocks in her father's car. Then she walked the rest of the way. What fraction of the distance did Ann walk? Explain how this drawing helps you find your answer.



Changing Fractions to Equal Fractions

Bob said to his mother, "Jack and I gathered one fourth of a pound of seeds. We each want an equal part, but we do not know how to divide a fourth by 2. Is there a way to do this?"

1. Suggest some ways to divide one fourth by 2, if you can think of some.

2. Bob's mother suggested that the boys change one fourth to eighths. How many eighths would that be? Now can the boys divide by 2? Make a drawing to show that your answer is correct. Your ruler might help you.

3. Mary's piece of modeling clay weighed three fourths of a pound. She wanted to divide it into two equal pieces. How much should each piece weigh? Use the fraction chart below to find the two parts that are equal to three fourths.

4. One half is equal to how many eighths?

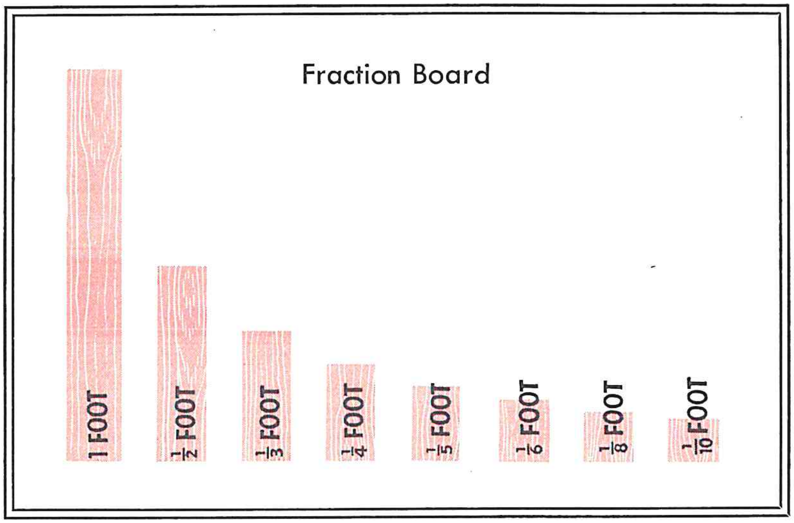
5. Two thirds are equal to how many sixths?

6. Four eighths are equal to how many fourths?

7. Three sixths are equal to how many halves?

A Fraction Chart

<table>
<tr><td colspan="24">ONE WHOLE</td></tr>
<tr><td colspan="12">$\frac{1}{2}$</td><td colspan="12">$\frac{1}{2}$</td></tr>
<tr><td colspan="8">$\frac{1}{3}$</td><td colspan="8">$\frac{1}{3}$</td><td colspan="8">$\frac{1}{3}$</td></tr>
<tr><td colspan="6">$\frac{1}{4}$</td><td colspan="6">$\frac{1}{4}$</td><td colspan="6">$\frac{1}{4}$</td><td colspan="6">$\frac{1}{4}$</td></tr>
<tr><td colspan="4">$\frac{1}{6}$</td><td colspan="4">$\frac{1}{6}$</td><td colspan="4">$\frac{1}{6}$</td><td colspan="4">$\frac{1}{6}$</td><td colspan="4">$\frac{1}{6}$</td><td colspan="4">$\frac{1}{6}$</td></tr>
<tr><td colspan="3">$\frac{1}{8}$</td><td colspan="3">$\frac{1}{8}$</td><td colspan="3">$\frac{1}{8}$</td><td colspan="3">$\frac{1}{8}$</td><td colspan="3">$\frac{1}{8}$</td><td colspan="3">$\frac{1}{8}$</td><td colspan="3">$\frac{1}{8}$</td><td colspan="3">$\frac{1}{8}$</td></tr>
</table>



A Fraction Board

This is a picture of a fraction board. The painted strips on a fraction board are one foot long, $\frac{1}{2}$ foot long, $\frac{1}{3}$ foot long, and so on. The blocks used on a fraction board are different lengths from $\frac{1}{10}$ foot to $\frac{1}{2}$ foot long.

1. Jack is trying to see how many different blocks he can use to cover the $\frac{1}{3}$-foot strip exactly. What different blocks can Jack use? Use the fraction chart on page 127 to show that your answer is correct.

2. What different blocks could he use to cover the $\frac{1}{2}$-foot strip? The 1-foot strip?

3. Henry used a $\frac{1}{5}$-foot block and three $\frac{1}{10}$-foot blocks to cover the $\frac{1}{2}$-foot strip. Did he cover the $\frac{1}{2}$-foot strip exactly?

4. How many of the $\frac{1}{8}$-foot blocks will cover exactly the $\frac{1}{2}$-foot strip?

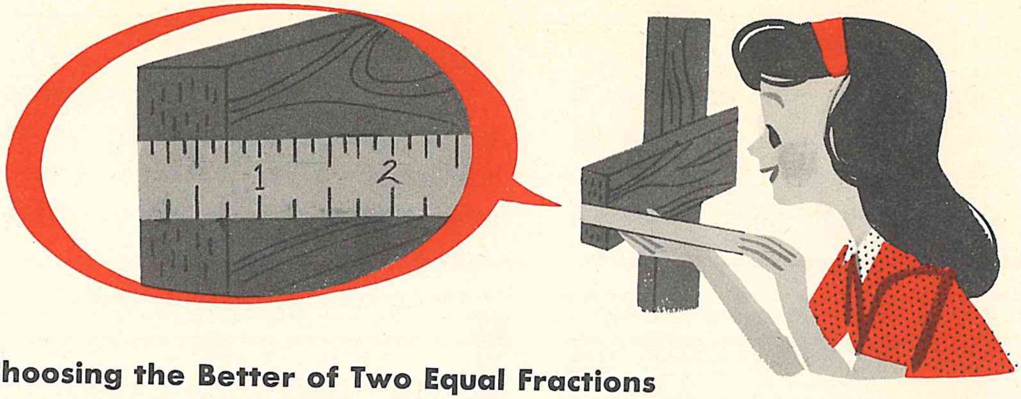
5. Joan used two equal blocks to cover the $\frac{1}{3}$-foot strip. What blocks did she use?

6. Tom laid three of the $\frac{1}{4}$-foot blocks on the 1-foot strip. Was the 1-foot strip entirely covered?

7. Nancy used these blocks to cover the 1-foot strip: one $\frac{1}{2}$-foot block, one $\frac{1}{3}$-foot block, and one $\frac{1}{6}$-foot block. How many sixths do all these blocks together equal? What is a quick way to find the answer to this question?

8. How many $\frac{1}{5}$-foot blocks would you need to cover the 1-foot strip?

9. How many $\frac{1}{10}$-foot blocks would you need to cover the 1-foot strip? To cover the $\frac{1}{2}$-foot strip?



Choosing the Better of Two Equal Fractions

Sally used a ruler to measure the thickness of a board. On one edge of the ruler, the inches were marked in eighths. On the other edge, the inches were marked in fourths.

1. How thick is the board if you use the top edge of the ruler?

2. How thick is the board if you use the bottom edge of the ruler?

3. The board in the picture is two and one fourth inches wide if the bottom of the ruler is read. How wide is the board if the top edge of the ruler is read?

4. Most people would say that the board is $\frac{3}{4}$ inch thick and $2\frac{1}{4}$ inches wide. Can you see why this is better than saying $\frac{6}{8}$ and $2\frac{2}{8}$?

5. Since $\frac{3}{4}$ inch and $\frac{6}{8}$ inch are the same width, what is the difference between these two measurements? Answering question 6 may help you answer this one.

6. Is it better to say 6 eggs are $\frac{6}{12}$ dozen, or is it better to say $\frac{1}{2}$ dozen?

■ **That part of a fraction which tells the number of equal parts in the whole is called the denominator of the fraction.**

7. Name the denominator in each of these fractions: one fifth, six sevenths, $\frac{2}{5}$, $\frac{5}{8}$, $\frac{1}{2}$.

8. In the fraction three fourths, three is the numerator. What is the numerator in one half? $\frac{3}{8}$? $\frac{1}{3}$? $\frac{7}{8}$?

■ **The numerator of a fraction tells how many of the equal parts in the whole we are talking about.**

9. In the statement, "The board is $\frac{3}{4}$ inch thick," what does the numerator of the fraction tell?

10. Does a fraction get its name from its numerator or its denominator?

Uses of Fractions

As Mother opened a carton of a dozen eggs, she said, "A third of these eggs are broken."

Ann looked and said, "I see 4 broken eggs. That is four twelfths."

1. Are $\frac{1}{3}$ and $\frac{4}{12}$ equal? Use a drawing to show that your answer is correct.

2. Mary set out 10 tomato plants. Only 5 of the plants grew. She said that $\frac{1}{2}$ of the plants grew.

Was Mary right when she said $\frac{1}{2}$ of the plants grew? Make a drawing to show that your answer is correct.

3. In John's flock of 12 pigeons, there were 3 brown ones, 7 white ones, and 2 blue ones. What fraction of his pigeons were blue?

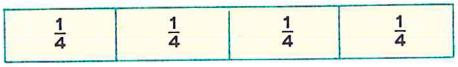
4. Gary thought that one third of John's pigeons were brown. Was he correct? Use a drawing to show how you found your answer.

5. It rained 3 of the 7 days last week. What fraction of the days did it rain?

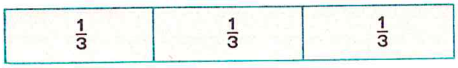
6. Most fourth-grade pupils spend about three eighths of their time sleeping. Is that more or less than one half of their time? Use a picture to show how you found your answer.

7. Is a one-sixth horsepower motor stronger than a one-fourth horsepower motor? Which of these drawings can you use to show that your answer is correct?

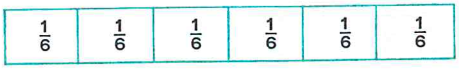
A.



B.



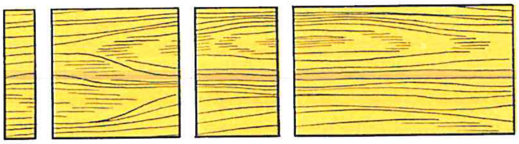
C.



8. Mother told Carol to peel and "quarter" an apple. Into how many equal parts will Carol cut the peeled apple?

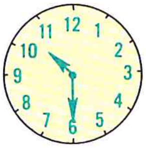
9. Why do we often call a 25-cent piece a "quarter"?

10. Tom sawed this board. Did he cut it into quarters?

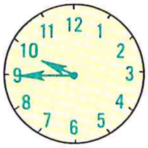


11. Which clock face below shows a quarter past 10 o'clock? Half past 10 o'clock? A quarter to 10 o'clock?

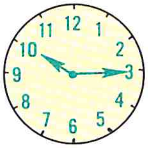
D.



E.



F.



1. Fractions, like whole numbers, can be written with words or with figures.
2. The two parts of a fraction such as three fourths are called the numerator and denominator. The three is the numerator. The fourths is the denominator.
3.

Some Facts About Fractions

The class answered certain questions before writing the facts given above. Here are the questions. Try to answer them. Then try to think of other facts about fractions.

1. In what two ways may fractions be written?

2. The two parts of a fraction have names. In the fraction three fourths, what is the three called? What name is given to the fourths?

3. The fraction three fourths has two parts. Do all fractions have two parts?

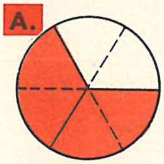
4. In the fraction $\frac{2}{5}$ what does the 2 tell? What does the 5 tell?

5. What part of a fraction, the numerator or the denominator, gives the name to the fraction?

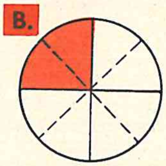
6. In the fraction five eighths, which part is the denominator?

7. Can fractions such as $\frac{2}{3}$ and $\frac{1}{5}$ be changed to equal fractions with different names? Explain how the drawings below help you to answer this question.

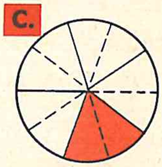
A.



B.

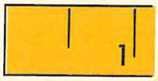


C.

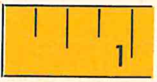


Copy. Fill in the missing part. Use the pictures at the right to help you.

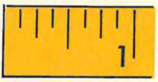
D.



E.

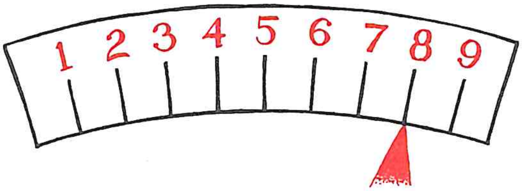


F.



8. 1 whole $= \frac{?}{2}$
9. 1 whole $= \frac{?}{8}$
10. 1 whole $= \frac{?}{4}$
11. $\frac{1}{2} = \frac{?}{8}$
12. $\frac{6}{8} = \frac{?}{4}$
13. $\frac{1}{4} = \frac{?}{8}$
14. $\frac{4}{8} = \frac{?}{2}$
15. $\frac{3}{4} = \frac{?}{8}$
16. $\frac{2}{2} = \boxed{?}$
17. $\frac{2}{8} = \frac{?}{4}$

How Well Have You Learned?



These exercises will help you to find out how well you have learned the work of Unit Five.

1. In these fractions, which fraction has a numerator of 4? Which fraction has a demoninator of 3?

$\frac{2}{3}$ $\frac{3}{4}$ $\frac{5}{6}$ $\frac{4}{5}$ $\frac{3}{8}$

2. Use a drawing to show what $\frac{3}{4}$ means.

3. Ann cut a cake into five equal parts. Five children together ate five fifths of Ann's cake. Together they ate what part of the cake?

4. Jim said that $\frac{1}{6}$ of his 384 stamps were French stamps. How many French stamps did he have?

5. Joe broke a candy bar into six equal pieces. He ate three of the pieces. Write two different fractions that will tell what part of his candy bar Joe ate. Make a drawing to show that your fractions are correct.

6. Jim bought 4 packages of foreign postage stamps. There were 96 stamps in each package. How many stamps did he buy? Multiply to find your answer. Then use addition to check your product.

7. Jack used a long way to find his quotient. Do Jack's division in a shorter way.

```
            124
JACK      8)992
          -800
           192
          -160
            32
           -32
             0
```

8. Ann said that you do not need to do all of the division to know that Tom's quotient is not correct. Look at Tom's division and explain what Ann meant.

```
          136, r 8
TOM     7)960
         -7
          26
         -21
           50
          -42
            8
```

9. Sue divided 159 by 8. Her quotient was 19, r7. Write the check that Sue could use to make sure that her quotient was correct.

Helping Yourself

The page numbers given in color tell you where to find help if you cannot give right answers.

Use folded paper. Write the quotients quickly. (109, 116, 121)

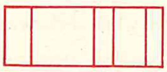
1. $6\overline{)12}$ $7\overline{)21}$ $8\overline{)24}$ $6\overline{)30}$
2. $8\overline{)32}$ $6\overline{)18}$ $8\overline{)40}$ $7\overline{)42}$
3. $7\overline{)56}$ $8\overline{)16}$ $8\overline{)48}$ $7\overline{)28}$
4. $6\overline{)24}$ $7\overline{)14}$ $8\overline{)64}$ $6\overline{)36}$
5. $8\overline{)56}$ $6\overline{)42}$ $8\overline{)72}$ $7\overline{)49}$
6. $6\overline{)54}$ $7\overline{)63}$ $7\overline{)35}$ $6\overline{)48}$

Copy. Find the quotients.

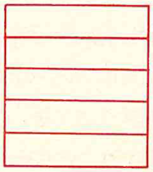
7. $6\overline{)45}$ $6\overline{)38}$ $6\overline{)584}$ (111, 112)
8. $7\overline{)99}$ $7\overline{)833}$ $6\overline{)954}$ (114-117)
9. $8\overline{)506}$ $8\overline{)927}$ $8\overline{)918}$ (118, 123)

10. Which drawing below shows something divided into fifths? (125)

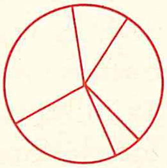
A.



B.



C.



11. Jack had 15 marbles. He gave $\frac{1}{5}$ of them to Bill. Make a drawing to show $\frac{1}{5}$ of Jack's marbles. (125)

Copy. Find the answers. (94, 95)

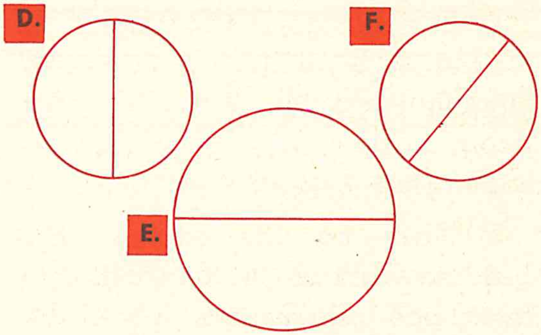
12. $\frac{1}{4}$ of $240 = \boxed{?}$
13. $\frac{1}{7}$ of $35 = \boxed{?}$
14. $\frac{1}{8}$ of $16 = \boxed{?}$

Write the missing part. (127)

15. $\frac{1}{2} = \frac{?}{8}$ $\frac{1}{2} = \frac{?}{6}$ $\frac{1}{2} = \frac{?}{4}$
16. $\frac{2}{6} = \frac{?}{3}$ $\frac{6}{8} = \frac{?}{4}$ $\frac{4}{8} = \frac{?}{2}$

17. Write a fraction having a denominator of 6 and a numerator of 4. Now write this fraction using words instead of numbers. (131)

18. Which of the following pictures show halves? Is $\frac{1}{2}$ of circle E equal to $\frac{1}{2}$ of circle F? Explain your answer. (125)

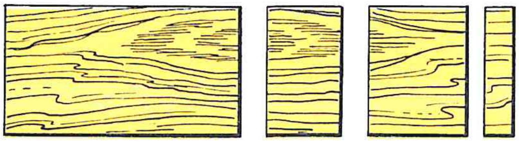


19. Write a fraction that is equal to $\frac{1}{4}$. Make a drawing to show that these two fractions are equal. (130)

How Well Are You Doing?

1. Carol cut a cake into 8 equal pieces. Tom ate 2 pieces of the cake. Carol said Tom ate $\frac{1}{4}$ of her cake. Was she right? Make a drawing to check your answer.

2. Bill had a piece of wood. He cut it as shown here.



Bill said he cut the piece of wood into fourths. How can you tell that Bill is wrong? Make a drawing of the piece of wood cut into fourths.

3. Bob wants to arrange 50 chairs in 8 equal rows. Can he do this? Explain your answer.

4. Bill delivered 182 papers in 7 days. If he delivered the same number of papers each day, how many papers did he deliver on each of the 7 days?

5. Gary has 32 rabbits. His brother wants to put 9 rabbits into each pen. Gary says it will be better to put 8 rabbits into each pen. Why do you think that Gary's plan is better?

6. The teacher asked Don to divide 225 reading books among 6 classes, giving each class the same number of books. How many books will each class get? How many books will there be left over?

7. Joe has 96 airplane pictures. He wants to lay them on the table in 8 equal rows. How many pictures should he put in a row?

8. Ann's mother bought Ann a pair of skates costing $7.98. What change should her mother receive if she gives the clerk a ten-dollar bill?

9. Bob picked 42 ears of corn. He tied $\frac{1}{2}$ dozen, or 6 ears, in each bundle. How many bundles did he make from the corn he picked?

10. Bob got $1.75 for some corn he sold and $3.25 for a bushel of apples. How much money did he get for these things?

11. Jim pulled 72 carrots from his garden. He wants to tie the carrots in bunches. To use all the carrots and have the same number of carrots in each bunch, should he tie 8 carrots or 9 carrots to a bunch? Explain your answer.

UNIT SIX

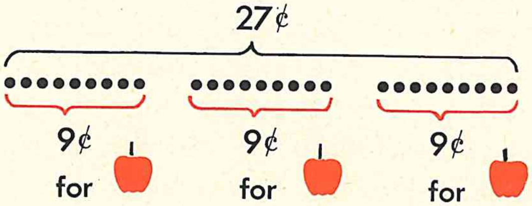
Dividing by 9

Betty was selling candied apples at a school carnival. A small boy put some pennies on the counter and said, "Give me 27¢ worth of candied apples."

Betty was puzzled. She thought everyone was going to say, "Give me 2 apples" or "Give me 4 apples," and that she could think, "2×9" or "4×9."

To find how many apples to give the boy, Betty had to answer this division question, "How many 9's equal 27?"

1. This picture shows how Betty thought to find the answer. Explain the picture.



2. How many apples should Betty give a man who asked for 45¢ worth of candied apples? Write the division question you thought to find your answer.

3. Betty thought a division table for 9's would help her sell faster. Here is the beginning of her table. Finish Betty's table through 81 ÷ 9 = 9.

BETTY

9 ÷ 9 = 1
18 ÷ 9 = 2
27 ÷ 9 = 3
36 ÷ 9 = 4
45 ÷ 9 =

Use your table to find answers to these questions.

4. How many candied apples should Betty give for 54¢? For 36¢? For 63¢? For 72¢? For 18¢?

5. How many apples should Betty give a man who laid 70¢ on the counter? How much change should she give him?

Remembering the Division Facts for 9's

1. When Jack made a division table for 9's, he did not know how many 8 nines equal. He thought, "5 nines equal 45, and 3 nines equal 27." Explain what Jack then did to find how many 8 nines equal.

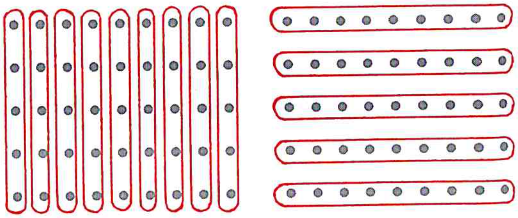
2. If you forgot how many 9 nines equal, how could Jack's way help you?

3. Bob said that 81 ÷ 9 = 9 was the only entirely new division fact that he had to learn in the division for 9's table. He said, "I think of related division facts as I write my division facts for 9's." Look at his work and explain what Bob meant.

BOB

Facts That I Know	Division Facts for 9's
9 ÷ 1 = 9	9 ÷ 9 = 1
18 ÷ 2 = 9	18 ÷ 9 = 2
27 ÷ 3 = 9	27 ÷ 9 = 3
36 ÷ 4 = 9	36 ÷ 9 = 4
45 ÷ 5 = 9	45 ÷ 9 = 5
54 ÷ 6 = 9	54 ÷ 9 = 6
63 ÷ 7 = 9	63 ÷ 9 = 7
72 ÷ 8 = 9	72 ÷ 9 = 8
None	81 ÷ 9 = 9

4. Jane used these dot drawings to find the answers to two division questions. Write the division question and its answer for each drawing.



5. Make dot drawings to show that 7 nines are as many as 9 sevens.

6. Bill says he remembers the division facts for 9's because he thinks of related multiplication facts. Finish the tables Bill began.

BILL

Multiplication Facts for 9's	Division Facts for 9's
1 × 9 = 9	9 ÷ 9 = 1
2 × 9 = 18	18 ÷ 9 = 2
3 × 9 = 27	27 ÷ 9 = 3
4 × 9 = 36	

7. Close your book. See if you can count backwards by 9's from 81 to 0.

8. Count forward by 9's from 27 to 72.

9. Count forward by 9's from 18 to 63.

Reviewing Division

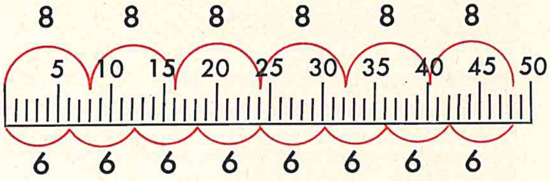
Use folded paper. Try to write the quotients as soon as you know what the number question asks. When you finish, page 327 will help you check your work.

1. $8\overline{)48}$ $7\overline{)49}$ $6\overline{)42}$ $9\overline{)45}$
2. $7\overline{)21}$ $8\overline{)32}$ $9\overline{)63}$ $6\overline{)48}$
3. $6\overline{)36}$ $9\overline{)54}$ $6\overline{)18}$ $7\overline{)28}$
4. $9\overline{)72}$ $7\overline{)56}$ $8\overline{)24}$ $9\overline{)36}$
5. $9\overline{)27}$ $7\overline{)42}$ $8\overline{)64}$ $6\overline{)54}$
6. $8\overline{)72}$ $6\overline{)24}$ $7\overline{)35}$ $8\overline{)40}$
7. $8\overline{)56}$ $7\overline{)63}$ $9\overline{)81}$ $6\overline{)30}$

8. If you find you are making mistakes, or if you cannot answer quickly, practice writing the quotients for the examples on page 328.

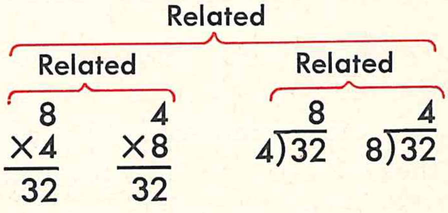
9. Page 90 showed you how to make Basic Division Fact Cards. If you are having trouble with the basic division facts, use page 327 and make a set of division fact cards. Page 90 tells you how to use these cards in your study.

10. Joan drew this number line to find the answers to two division questions. Write the two division questions and their answers.



11. Joan's number line also shows two basic multiplication facts. Write these two facts.

12. Draw a number line that shows that these four basic facts are related.



For each set of numbers, write four basic facts that are related.

13. 7, 9, 63 9, 8, 72

14. 6, 9, 54 3, 9, 27

15. 9, 2, 18 5, 9, 45

16. 4, 9, 36 1, 9, 9

17. Give two basic division facts for each of these numbers.

72 45 63 27 54

18. Can you give two basic division facts for 81? Explain your answer.

1. How many teams of 9 boys each can you make from a group of 80 boys? How many boys will be left over?
2. Jim had a strip of wood that was 78 inches long. He cut the strip into 9-inch pieces to use as tent pegs. How many pegs did he cut? How many inches were left over?
3. Mary found that she could wash a window in 9 minutes. How many such windows can Mary wash in 75 minutes? How many minutes will she have left over?

Using the Basic Division Facts for 9

Above you see three problems that a teacher wrote on the board for her class. She said, "Read all of these problems carefully. Then tell me in which problem you use this basic division fact: 8 nines equal 72."

1. How would you answer this teacher's question?

2. One pupil said he could answer the teacher's question without working any of the problems. You can do this, too, if you use the table for dividing by 9 given at the top of page 139. Explain.

3. How many pencils will you have left over if you divide 24 pencils equally among 9 children?

4. If it takes 9 minutes to ride 1 mile on your bicycle, how many miles can you ride in 45 minutes?

Say the quotients with their remainders. The table on the next page will help you.

5. $9\overline{)59}$ $9\overline{)41}$ $9\overline{)30}$ $9\overline{)89}$

6. $9\overline{)65}$ $9\overline{)76}$ $9\overline{)83}$ $9\overline{)48}$

7. $9\overline{)74}$ $9\overline{)58}$ $9\overline{)75}$ $9\overline{)21}$

8. $9\overline{)13}$ $9\overline{)29}$ $9\overline{)40}$ $9\overline{)37}$

9. $\frac{1}{9}$ of $36 = \boxed{?}$ $\frac{1}{9}$ of $54 = \boxed{?}$

10. $\frac{1}{9}$ of $63 = \boxed{?}$ $\frac{1}{9}$ of $72 = \boxed{?}$

11. $\frac{1}{9}$ of $9 = \boxed{?}$ $\frac{1}{9}$ of $81 = \boxed{?}$

TABLE FOR DIVIDING BY 9

Basic Fact Helper	$\begin{array}{r}1\\9\overline{)9}\end{array}$	$\begin{array}{r}2\\9\overline{)18}\end{array}$	$\begin{array}{r}3\\9\overline{)27}\end{array}$	$\begin{array}{r}4\\9\overline{)36}\end{array}$	$\begin{array}{r}5\\9\overline{)45}\end{array}$	$\begin{array}{r}6\\9\overline{)54}\end{array}$	$\begin{array}{r}7\\9\overline{)63}\end{array}$	$\begin{array}{r}8\\9\overline{)72}\end{array}$	$\begin{array}{r}9\\9\overline{)81}\end{array}$
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
To divide these umbers by 9, hink back to he basic fact bove.	10 11 12 13 14 15 16 17	19 20 21 22 23 24 25 26	28 29 30 31 32 33 34 35	37 38 39 40 41 42 43 44	46 47 48 49 50 51 52 53	55 56 57 58 59 60 61 62	64 65 66 67 68 69 70 71	73 74 75 76 77 78 79 80	82 83 84 85 86 87 88 89

12. Copy and finish each of these division examples.

A. $\begin{array}{r} 9,\,? \\ 9\overline{)86} \\ -\,81 \\ \hline ? \end{array}$ **B.** $\begin{array}{r} 6,\,? \\ 9\overline{)60} \\ -\,?? \\ \hline ? \end{array}$ **C.** $\begin{array}{r} ?,\,? \\ 9\overline{)77} \\ -\,?? \\ \hline ? \end{array}$

13. Copy and finish each of these division examples.

D. $\begin{array}{r} 1? \\ 9\overline{)108} \\ -\,9 \\ \hline ?? \\ -\,?? \\ \hline \end{array}$ **E.** $\begin{array}{r} ?? \\ 9\overline{)477} \\ -\,45 \\ \hline ?? \\ -\,?? \\ \hline \end{array}$ **F.** $\begin{array}{r} 9? \\ 9\overline{)837} \\ -\,?? \\ \hline ?? \\ -\,?? \\ \hline \end{array}$

▶ Copy. Find the quotients, and the remainders, if there are remainders.

14. $9\overline{)263}$ $9\overline{)850}$ $9\overline{)288}$ $9\overline{)306}$

15. $9\overline{)683}$ $9\overline{)825}$ $9\overline{)657}$ $9\overline{)198}$

16. $9\overline{)562}$ $9\overline{)473}$ $9\overline{)108}$ $9\overline{)144}$

17. Find the quotient for each of the following. How are the quotients alike? How are they different?

G. $9\overline{)18}$ **H.** $9\overline{)180}$ **I.** $9\overline{)1800}$

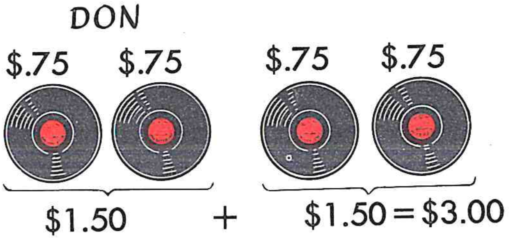
▶ Copy. Find the quotients.

18. $9\overline{)270}$ $9\overline{)3600}$ $9\overline{)90}$

Multiplying and Dividing Money Numbers

Don wants to buy 4 song records at $.75 each. Don said, "I think the 4 records ought to cost about $3.00. But when I multiply, my answer is $300."

1. Don made a drawing and found that his answer should be $3.00. Explain his drawing.



2. Look at the way Don multiplied. What did Don forget to do when he tried to find his answer by multiplying?

DON

$$\begin{array}{r} \$.75 \\ \times 4 \\ \hline \$300 \end{array} \quad \times$$

Jim sold 7 magazines at 35¢ each. He said he could use three different ways to find how much money he should have.

3. Look at Jim's work in the next column. Explain the first way that he used.

4. How are Jim's second and third ways alike? How are they different? Which of these two ways do you think is better? Why?

JIM

First Way

$$\begin{array}{r} \$\ .35 \\ .35 \\ .35 \\ .35 \\ .35 \\ .35 \\ +\ .35 \\ \hline \$2.45 \end{array}$$

Second Way

$$\begin{array}{r} 35¢ \\ \times 7 \\ \hline 245¢ \end{array}$$

Third Way

$$\begin{array}{r} \$.35 \\ \times 7 \\ \hline \$2.45 \end{array}$$

5. What rule did Jim use when he showed dollars and cents in his third answer?

6. Have you ever seen an advertisement that said, "Shoes — 695¢ a pair"? How would the price of the shoes be written?

7. If a number means dollars and cents, how many places are there at the right of the cents point?

8. How would you write six dollars and four cents?

Use the dollar sign and cents point and write these money numbers.

9. One dollar and fifteen cents
10. Twenty-five cents
11. Eight cents
12. Thirty dollars and ten cents

▶ Copy. Find the answers. Use the dollar sign and cents point to show dollars and cents in your answers.

13. $\begin{array}{r}\$.75\\ \times 2\\ \hline\end{array}$ $\begin{array}{r}\$.18\\ \times 4\\ \hline\end{array}$ $\begin{array}{r}\$.60\\ \times 7\\ \hline\end{array}$ $\begin{array}{r}\$.95\\ \times 6\\ \hline\end{array}$

14. $\begin{array}{r}\$2.35\\ \times 5\\ \hline\end{array}$ $\begin{array}{r}\$1.50\\ \times 2\\ \hline\end{array}$ $\begin{array}{r}\$6.95\\ \times 3\\ \hline\end{array}$ $\begin{array}{r}\$4.10\\ \times 5\\ \hline\end{array}$

15. $\begin{array}{r}\$2.49\\ \times 3\\ \hline\end{array}$ $\begin{array}{r}\$5.11\\ \times 2\\ \hline\end{array}$ $\begin{array}{r}\$1.89\\ \times 5\\ \hline\end{array}$ $\begin{array}{r}\$5.05\\ \times 6\\ \hline\end{array}$

16. Jane has saved $6.36. She plans to buy 3 presents, each costing the same amount of money. She says that she can spend $2.12 for each present. Explain how Jane got $2.12 for her answer.

JANE

$$\begin{array}{r}2 \text{ dollars}\\ 3\overline{)6 \text{ dollars}}\end{array} \qquad \begin{array}{r}12 \text{ cents}\\ 3\overline{)36 \text{ cents}}\end{array}$$

2 dollars + 12 cents =
2 dollars and 12 cents

17. Jack said that Jane would not have to write the words dollars and cents if she used the dollar sign and cents point. Do Jane's division, using the way that Jack suggested.

18. Ann paid $1.50 for 6 bags of popcorn. To find the cost of each bag, she divided. Explain Ann's division and her check.

ANN

$$\begin{array}{r}\$\ .25\\ 6\overline{)\$1.50}\\ 12\\ \hline 30\\ -\ 30\\ \hline\end{array} \qquad \begin{array}{r}\text{CHECK}\\ \$.25\\ \times 6\\ \hline \$1.50\end{array}$$

■ **When you use the dollar sign and cents point to show cents, or dollars and cents, in your answer, you must have two places at the right of the cents point.**

▶ Copy. Divide. Check. Be sure to place the cents point correctly.

19. $4\overline{)\$3.24}$ $5\overline{)\$4.85}$ $3\overline{)\$1.38}$

20. $2\overline{)\$1.56}$ $4\overline{)\$2.96}$ $5\overline{)\$2.60}$

21. $7\overline{)\$6.44}$ $6\overline{)\$1.32}$ $7\overline{)\$5.04}$

22. $5\overline{)\$8.60}$ $7\overline{)\$9.24}$ $6\overline{)\$7.92}$

23. $4\overline{)\$9.56}$ $3\overline{)\$4.92}$ $5\overline{)\$7.80}$

Problems Using Money Numbers

1. Sam has saved \$7.85. How much more must he save to buy a \$10.00 pair of shoes?

2. Sue spent \$.75 for a scarf and \$2.95 for an umbrella. How much did both of these things cost?

3. Jerry bought a billfold that cost \$2.98. He gave the clerk a 5-dollar bill. How much change should Jerry receive?

4. Mary paid \$3.95 a yard for some curtain material. What will she have to pay for 6 yards of the material?

5. Joe earned \$7.96. He spent $\frac{1}{4}$ of this money to have his shoes repaired. How much did the shoe repair cost?

6. Sue spends the same amount each day for her school lunch. After 5 days she found that she had spent \$1.25. What did she spend for lunch each day?

7. A club of 7 boys bought a used record player for \$9.45. How much must each boy pay if they agree to share the cost equally?

8. Jack's father earns \$2.75 an hour. How much will his father earn in 8 hours?

Answers Only

1. Bob wrote a quotient with 6 in hundreds place, zero in tens place, and 9 in ones place. What was Bob's quotient?

2. Alice cut a cake into eighths. How many pieces did she have?

3. What is the largest number that you can write using the figures 7, 0, and 9?

4. What is the smallest number that you can write using the figures 7, 0, and 9?

5. What figure is in tens place in the number 450? The whole number is equal to how many tens?

6. What figure is in ones place in the number 56? The whole number is equal to how many ones?

7. What figure is in hundreds place in 500? In tens place?

8. Give the sum of these numbers quickly: 600 + 50 + 3.

9. How many dimes can you get in exchange for a 50¢ piece?

10. Give an example in which 7 is the divisor.

11. What do we call the number to be divided?

Measuring Improvement — Test 6

Find out if your work is improving. Begin when the teacher tells you. Work until you hear the signal to stop.

Write answers on folded paper.

1. $9\overline{)72}$ $8\overline{)64}$ $5\overline{)45}$ $9\overline{)27}$
2. $7\overline{)49}$ $7\overline{)63}$ $9\overline{)81}$ $8\overline{)72}$
3. $9\overline{)36}$ $8\overline{)56}$ $9\overline{)18}$ $6\overline{)48}$
4. $6\overline{)54}$ $9\overline{)45}$ $9\overline{)63}$ $9\overline{)54}$

Copy and find the answers.

5.
$$\begin{array}{rrr} 936 & \$6.58 & 8\text{¢} \\ 253 & .31 & 5\text{¢} \\ 127 & 5.40 & 6\text{¢} \\ \underline{+435} & \underline{+.07} & \underline{+9\text{¢}} \end{array}$$

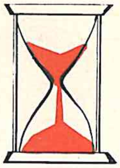
6.
$$\begin{array}{rrr} 429 & 784 & \$4.25 \\ \underline{\times 9} & \underline{\times 9} & \underline{\times 2} \end{array}$$

7. $\$74.00 - \$51.85$

8. $8\overline{)96}$ $9\overline{)729}$ $5\overline{)\$2.15}$

9. $8\overline{)2400}$ $7\overline{)574}$ $8\overline{)99}$

10.
$$\begin{array}{rrr} 783 & 746 & \$5.05 \\ \underline{-275} & \underline{-78} & \underline{-1.27} \end{array}$$



Find out how many correct answers you have. Write the number of correct answers at the top of your paper.

This is Improvement Test 6. When you put this test in your arithmetic notebook, compare it with your first five tests. Is your work improving?

Special Helps

1. If you made mistakes in rows 1-4, practice writing the answers to the division questions on page 328.

2. If you made mistakes in multiplying money numbers, study page 140.

3. If you made mistakes in dividing money numbers, you will find help on page 141.

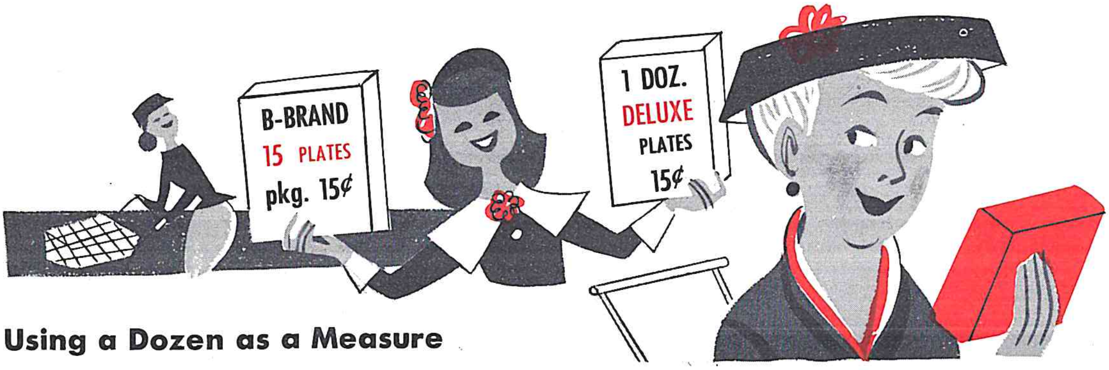
▶ Copy. Find the quotients.

4. $7\overline{)\$8.61}$ $6\overline{)\$4.56}$ $5\overline{)\$2.85}$

5. $9\overline{)\$8.28}$ $8\overline{)\$9.96}$ $6\overline{)\$8.58}$

▶ Copy. Find the products.

6.
$$\begin{array}{rrrr} \$6.27 & \$4.01 & \$8.36 & \$1.95 \\ \underline{\times 7} & \underline{\times 9} & \underline{\times 8} & \underline{\times 6} \end{array}$$



Using a Dozen as a Measure

1. Ann said, "I believe I will buy the B-Brand paper plates. I will get more for my money." Look at the picture. What did Ann mean?

2. Name some things that are usually sold by the dozen.

3. The grocer gave Tom an empty packing box. On the side of the box, Tom read, "Favorite Dog Food — 4 dozen cans."

Tom said there were 48 cans of dog food in the box when it was full, because $12 + 12 + 12 + 12 = 48$. Why did Tom add 12 four times?

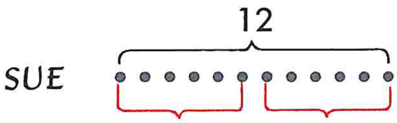
4. Tom added to find the number of cans in 4 dozen. Show a shorter way that Tom could use to find how many 4 dozen equal.

5. While on the farm, Gary gathered 6 dozen eggs for his grandfather. How many eggs was this?

6. How many oranges will you get if you buy 3 dozen oranges? 5 dozen oranges? 9 dozen oranges?

7. Sue's mother told Sue to get $\frac{1}{2}$ doz. spools of thread. The clerk showed Sue a box with 6 spools of thread in it.

This picture shows what Sue thought when she wanted to know if 6 spools were the same as $\frac{1}{2}$ doz. Explain what the picture shows.



Make a drawing to show how you think to answer the following questions.

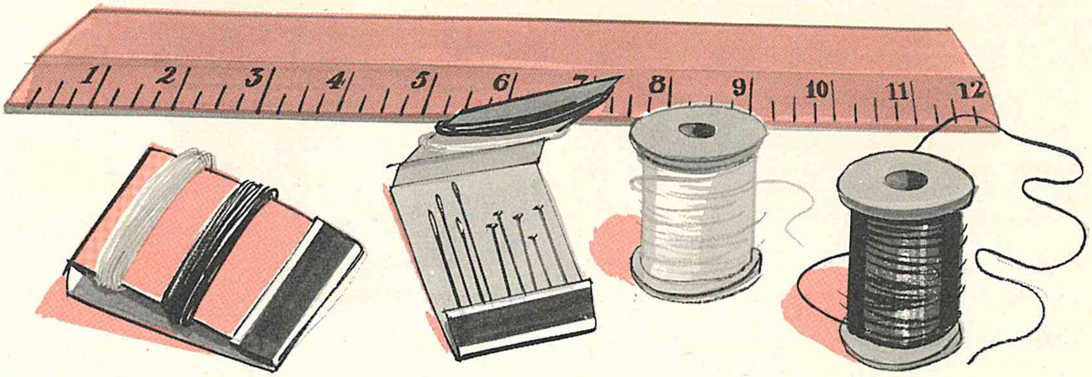
8. $\frac{1}{4}$ doz. eggs = ☐ eggs

9. $\frac{1}{3}$ doz. buttons = ☐ buttons

10. $\frac{1}{6}$ doz. pencils = ☐ pencils

11. Jane needs a dozen buttons on her new dress. If she has sewed 3 buttons on the dress, how many more does she have to sew on the dress to finish?

12 things = 1 dozen (doz.)
144 things = 1 gross



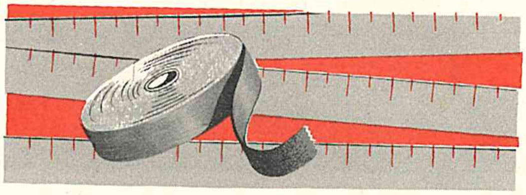
Measuring Length

Ann's class was making mending kits from empty match folders to use as gifts at a party for parents. Each child needed 2 yards of white thread and 3 yards of black thread to wind around the cover of his kit.

1. Ann could find only foot rulers for measuring the thread. How many times did she have to use a foot ruler to measure 1 yard of thread? 2 yards? 3 yards?

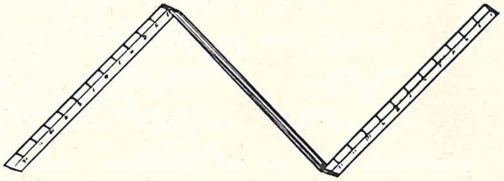
2. Ann said, "This is not an easy way to measure 2 or 3 yards. I wish I had a yardstick." How many feet long is a yardstick?

3. Tom said, "I can use some gummed paper and some foot rulers and make a yardstick." Explain how Tom made his yardstick.



4. Tom's yardstick can help you remember how many inches equal 1 yard. Explain these two helps.

$$12+12+12=36$$
$$3\times12=36$$



Think of Tom's yardstick and answer the following questions.

5. $\frac{1}{3}$ yard = ⍰ inches

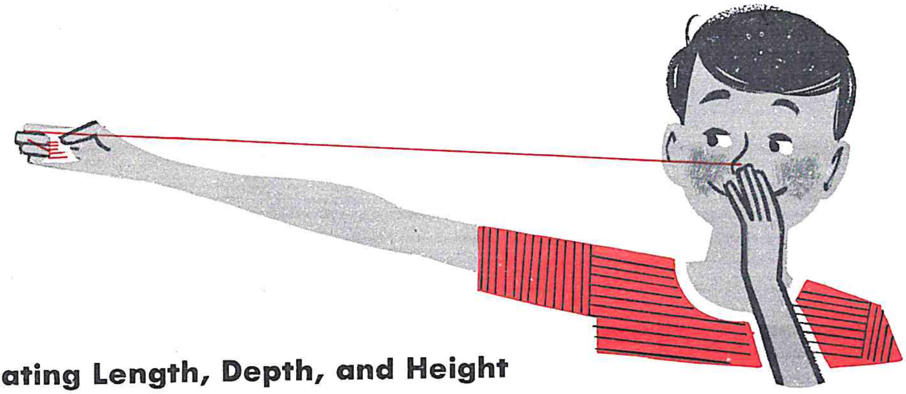
6. $\frac{2}{3}$ yard = ⍰ inches

7. 5 yards = ⍰ feet

8. 4 yards = ⍰ feet

9. Name some things you might buy that are measured in inches. Name some things you might buy that are measured in feet.

10. Name some things you would measure in yards if you were a clerk in a department store.



Estimating Length, Depth, and Height

Bill said the thread for his mending kit did not need to be measured exactly. Instead of using a yardstick, he measured what he called an "arm yard."

He held the end of the thread to the tip of his nose with one hand. Then, holding the spool in the other hand, he stretched his arm down and backward as far as he could reach. He said this measured about 1 yard of the thread.

1. Measure a thread or string as Bill did. Then use a yardstick to find out if your "arm yard" is about 1 yard in length.

2. Have you ever seen another way to measure an "arm yard"?

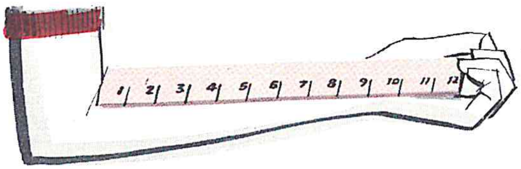
3. Can you think of a time when you might find the "arm yard" useful?

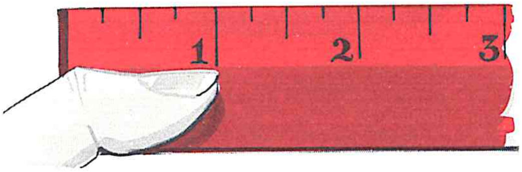
4. In the picture below, Bob is showing you what part of his arm he uses in estimating 1 foot. Do as Bob is doing and find out if you can use your arm in this way to estimate 1 foot.

5. Tom is showing you what he calls a "finger inch." Use a ruler and find a "finger inch" on your hand.

6. Jim says his father is exactly 6 feet tall. Jim says he thinks a certain stalk of corn is about 7 feet high. How does his father's height help Jim to estimate the height of the corn?

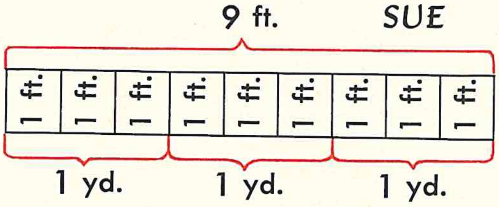
7. Tom says that the water where he is swimming is about 4 feet deep because it reaches his chin. How do you think Tom estimates the depth of the water?



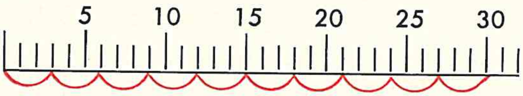


Using a Table for Measuring Length

1. Sue's mother said she would lend her a 9-ft. tablecloth for use at a parents' party at school. The teacher had said the tablecloth had to be 3 yd. long. Sue wondered if 9 ft. and 3 yd. were equal. Explain the drawing Sue used to find out.



2. Mrs. Brown wants to buy a carpet runner for a hall that is 30 ft. long. How many yards long must a runner be to be exactly as long as the hall? Explain how the following number line drawing shows 30 ft. changed to yards.



Use a number line to find the answers to the following examples.

3. 15 ft. = ▢ yd. 21 ft. = ▢ yd.

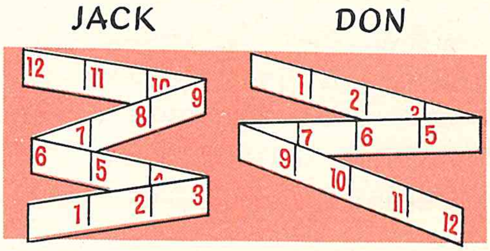
4. 6 ft. = ▢ yd. 18 ft. = ▢ yd.

MEASURES OF LENGTH

12 inches (in.) = 1 foot (ft.)
3 feet (ft.) = 1 yard (yd.)
5280 feet (ft.) = 1 mile (mi.)

5. Try to make up a rule for changing a given number of feet to an equal number of yards.

Jack and Don each had a paper foot ruler. Jack folded his ruler into thirds. Don folded his ruler into fourths. Use their rulers to be sure that your answers to examples 6 and 7 are correct.



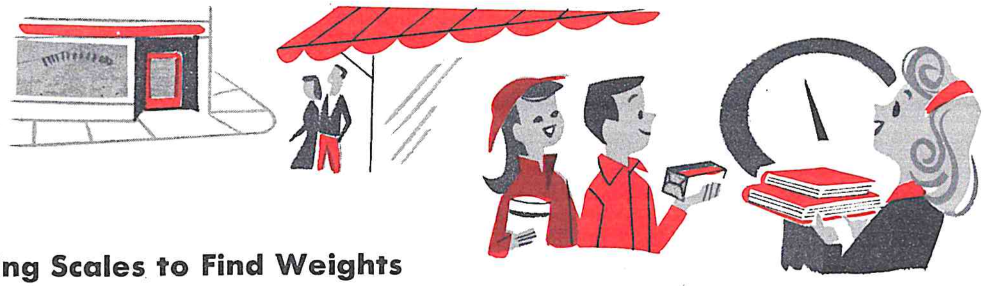
6. Jack said that $\frac{1}{3}$ ft. = 4 in. because $\frac{1}{3}$ of 12 = 4. Was he right?

7. $\frac{1}{4}$ ft. = ▢ in. $\frac{1}{2}$ ft. = ▢ in.

8. Gary lives $\frac{1}{5}$ mi. from school. How many feet does $\frac{1}{5}$ mi. equal?

9. Joan won a $\frac{1}{4}$-mi. skating race. How many feet did she skate?

10. A farm is enclosed by 2 mi. of wire fencing. How many feet of wire fencing is this?



Using Scales to Find Weights

On the way to the library, Debby put a penny in the slot of a scale and read her weight. When she stepped off the scale, she said, "I weigh exactly 78 pounds."

Tom laughed. "I know you don't weigh exactly 78 pounds," he said.

1. Look at the picture of Debby. What do you think Tom meant?

Debby had no penny to get weighed again. Tom said, "Give us your books. We can tell about how much you weigh. This small book feels about as heavy as this pound of butter I have just bought."

2. About how much did Debby's smaller book weigh?

Judy took Debby's larger book. She said, "This book feels about as heavy as this 2-pound can of coffee that I have just bought."

3. How many pounds did Judy think the larger book weighed?

4. Together the two books weighed about how many pounds?

Debby said, "Now I see why you said I don't weigh exactly 78 pounds. But if you count that way, what about my clothes? They must weigh about 3 pounds."

5. About what was Debby's weight? Explain your answer.

6. Which of these things do you think weigh about 1 pound?

2 large apples
your arithmetic book
a blackboard eraser

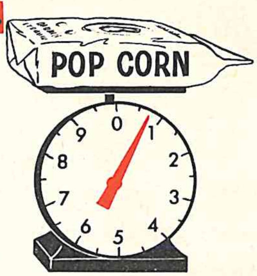
7. Try to have someone bring a household scale to school. Practice estimating the weight of different things. Then use the scale to see how well you estimated.

8. Many things, such as a pencil or a piece of chalk, will weigh much less than a pound. Study the table of measures given below.

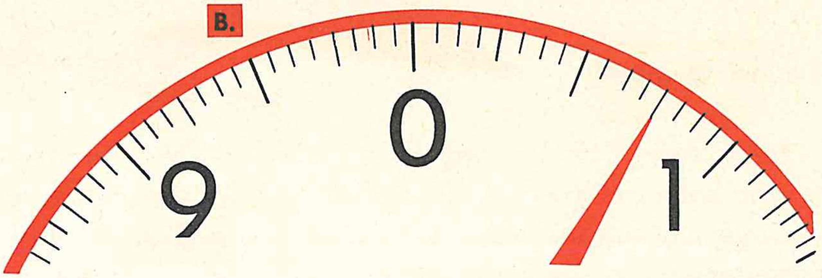
MEASURES OF WEIGHT

16 ounces (oz.) = 1 pound (lb.)
2000 pounds (lb.) = 1 ton (T.)

A.



B.



What measure will you very likely use to weigh things that are less than 1 pound?

9. The picture above shows a bag of popcorn that Bob weighed. How many ounces does the bag of popcorn weigh? Does it weigh more or less than $\frac{1}{2}$ lb.? The picture at the right above will help you.

Use picture B above if you need help in answering the following.

10. Joan saw a can of pepper on the pantry shelf. The label read, "Net weight, 8 oz." What did net mean? What part of a pound of pepper did the can contain?

11. Bill says that when he buys 8 oz. of cheese, he gets $\frac{1}{2}$ lb. of cheese, because $\frac{1}{2}$ of $16 = 8$. Where did Bill get the 16 he used in his problem?

12. $\frac{1}{2}$ lb. = ? oz.

13. $\frac{1}{8}$ lb. = ? oz.

14. $\frac{3}{4}$ lb. = ? oz.

Use the table of weight at the bottom of page 148 to answer the following.

15. Jerry's father owns a 5-ton truck. About how many pounds of coal can he carry if he fills his truck?

16. How many pounds does a half ton of corn weigh?

17. A horse weighs about 1200 lb. Such a horse weighs how much less than a ton?

18. $\frac{1}{5}$ T. = ? lb.   6 T. = ? lb.

19. $\frac{1}{4}$ T. = ? lb.   4 T. = ? lb.

20. $\frac{1}{8}$ T. = ? lb.   3 T. = ? lb.

Make a list of several things that are often bought by the ounce. By the pound. By the ton.

Try to bring some pictures for the bulletin board showing things being weighed.

Try also to bring pictures or labels from packages which tell the weights of different things.

Round Numbers

Jerry said, "How many miles is it from here to Oakville? Is it about 30 miles, about 40 miles, or about 50 miles?"

His father said, "It is about 40 miles." Just then Jerry saw a road sign that read, "Oakville — 36 miles."

1. Why did Jerry's father say about 40 miles instead of about 30 miles?

2. The same sign read, "Cedar Lake — 72 miles." This is the exact distance. Give this distance to the nearest ten miles.

3. Jim saw this statement in a newspaper: "There were 3532 persons at the ball game." If Jim were to give the number of persons to the nearest hundred, how many would he say were at the game?

4. Tom paid $4.95 for a sweater. He told Joe the sweater cost about $5.00. If Tom had paid $3.79 for the sweater, he could have said it cost about how many dollars?

You gave the distance to Cedar Lake to the nearest ten miles, or 70 miles. The number of persons at the ball game was given to the nearest hundred, or 3500 persons. Tom gave the price of his sweater as $5.00. Numbers like these are called round numbers.

5. Round these numbers to the nearest 10.

68 84 96 124 567 211

6. Round these numbers to the nearest 100.

420 698 1002 6325 1955

7. Round these amounts of money to the nearest dollar.

$1.02 $.89 $4.65 $10.25 $.56

8. Can you give at least one reason for using round numbers?

9. Mrs. Lane has a five-dollar bill in her purse. She wants to buy 5 yards of cloth at $.95 a yard. How can she use round numbers and think quickly to find out if $5.00 is enough money to get the cloth?

10. Jack said there are about 600 pupils in his school. There are exactly 591 pupils in Jack's school. Did he round the number to the nearest hundred? Can you say he rounded it to the nearest ten?

11. Sue saved 175 bottle caps for a prize. Round this number to the nearest 10. To the nearest 100.

Using Round Numbers to Estimate Answers

Tom and Ann were looking in a store window. A sign said, "Handkerchiefs — 49¢ each."

Ann said, "I wish I had paper and pencil. I would like to find out if $1.00 will be enough money to buy 2 handkerchiefs."

1. Tom said, "You do not need a pencil if you use round numbers and estimate your answer." What did Tom mean?

2. Use your pencil and find the exact cost of 2 handkerchiefs at 49¢ each.

3. Tom estimated that he would have to pay about 70¢ for a 19¢ ball of string and a 39¢ kite. Round each amount of money to the nearest ten, and see if Tom estimated his answer correctly.

4. What would be the exact cost of the string and kite Tom wanted?

5. Carol said 82 pencils and 19 pencils equal about 100 pencils. How did she estimate her answer?

6. Jerry had 79¢. He estimated that he would have about 50¢ left if he bought a 28¢ lunch. How did he round his amounts of money to get the answer he estimated?

Round the amounts below to the nearest ten, and estimate the sum. Then find the exact sum.

7. 41 + 29 = ? 28 + 33 = ?
8. 18 + 62 = ? 51 + 42 = ?
9. 59 + 32 = ? 29 + 9 = ?

Round the amounts below to the nearest ten, and estimate the difference. Then find the exact difference.

10. 83 − 32 = ? 52 − 19 = ?
11. 98 − 59 = ? 71 − 38 = ?
12. 87 − 23 = ? 50 − 19 = ?

Mixed Review

1. $\begin{array}{r}4000\\-299\\\hline\end{array}$ $\begin{array}{r}167\\\times 9\\\hline\end{array}$ $\begin{array}{r}5624\\-2938\\\hline\end{array}$ $\begin{array}{r}705\\\times 8\\\hline\end{array}$

2. 3 + 246 + 40 + 451 + 578

3. $4\overline{)564}$ $5\overline{)863}$ $7\overline{)385}$ $7\overline{)96}$

4. 1796 − 59

5. $45.00 − $4.56

6. $4.25 + $.06 + $18.90 + $1.40

7. $\begin{array}{r}\$4.25\\\times 2\\\hline\end{array}$ $\begin{array}{r}438\\\times 9\\\hline\end{array}$ $\begin{array}{r}\$.75\\\times 6\\\hline\end{array}$ $\begin{array}{r}500\\\times 7\\\hline\end{array}$

8. $15.35 ÷ 5 $12.81 ÷ 3

Dividing the Left-Over Part

Joe, Ann, and Ruth were making helper cards. They had 4 sheets of heavy paper. They wanted to divide the paper equally among the three of them.

Joe said, "Each of us can have 1 whole sheet of paper. What will we do with the left-over sheet?"

1. How would you answer Joe's question?

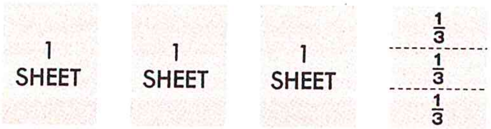
2. The picture above shows Ruth dividing 1 sheet of paper into equal parts. What is one of the equal parts called?

3. Ann drew pictures to show how to divide the paper equally among Joe, Ann, and Ruth. Explain the pictures that Ann drew.

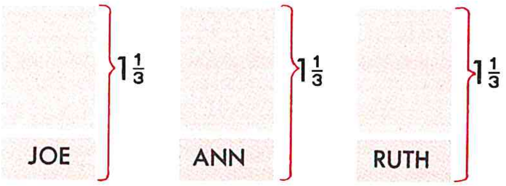
4. $\begin{array}{r}\boxed{?}\\3\overline{)4}\end{array}$ $4 \div 3 = \boxed{?}$ $\frac{1}{3}$ of $4 = \boxed{?}$

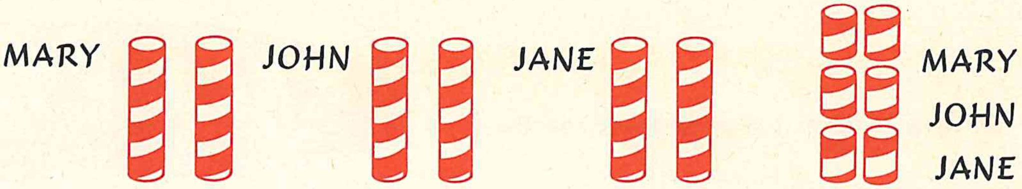
ANN

Ready to Divide



After Dividing





5. In the picture at the top of the page, some sticks of candy were divided equally among some children. How many children were there?

6. How many sticks of candy in all were there to be divided?

7. How many whole sticks of candy did each child get?

8. What part of a stick of candy did each child also get?

9. What was each child's share of the candy?

Copy and answer these division questions.

10. $\begin{array}{r}⍰\\3\overline{)8}\end{array}$ $8 \div 3 = ⍰$ $\frac{1}{3}$ of $8 = ⍰$

11. Draw a picture to show 5 candy bars divided equally among 4 children. How many whole bars did each child get? What part of the left-over bar did each child get? What was each child's share of the candy bars?

Copy and answer these division questions.

12. $\begin{array}{r}⍰\\4\overline{)5}\end{array}$ $\frac{1}{4}$ of $5 = ⍰$ $5 \div 4 = ⍰$

Here are some divisions in which the left-over part has been divided. Draw pictures of sheets of paper, sticks of candy, or candy bars to show that the quotients are correct.

13. $\begin{array}{r}1\frac{1}{2}\\2\overline{)3}\end{array}$ $\begin{array}{r}2\frac{1}{3}\\3\overline{)7}\end{array}$ $\begin{array}{r}1\frac{2}{5}\\5\overline{)7}\end{array}$ $\begin{array}{r}2\frac{1}{4}\\4\overline{)9}\end{array}$

14. $\begin{array}{r}1\frac{2}{3}\\3\overline{)5}\end{array}$ $\begin{array}{r}1\frac{3}{4}\\4\overline{)7}\end{array}$ $\begin{array}{r}3\frac{1}{2}\\2\overline{)7}\end{array}$ $\begin{array}{r}1\frac{1}{6}\\6\overline{)7}\end{array}$

Showing the Left-Over Part as a Remainder

In many of your division examples you have done your dividing as shown at the right. What does r 3 mean?

$$\begin{array}{r}3,\ \text{r}\ 3\\4\overline{)15}\\\underline{12}\\3\end{array}$$

15. Make a dot drawing to show that each of the following divisions is correct.

A. $\begin{array}{r}3,\text{r}\ 2\\3\overline{)11}\end{array}$ B. $\begin{array}{r}4,\text{r}\ 1\\5\overline{)21}\end{array}$ C. $\begin{array}{r}7,\text{r}\ 1\\4\overline{)29}\end{array}$

▶ Copy. Divide. Write each left-over part as a remainder.

16. $5\overline{)37}$ $4\overline{)30}$ $3\overline{)19}$ $6\overline{)46}$

Thinking About the Left-Over Part

The teacher asked a group of boys to form 2 teams for a game. There were 13 boys in the group. Jerry said there would be $6\frac{1}{2}$ boys on each team because $13 \div 2 = 6\frac{1}{2}$.

1. Did Jerry divide 13 by 2 correctly?

2. What do you think of Jerry's answer?

3. Bill had 7 birds. He wanted to put no more than 2 birds in each cage. Joe said Bill would need 4 cages. Can you explain what Bill meant?

4. Bob had a board that was 10 feet long. He cut pieces from it each 3 feet long. How many 3-foot pieces did he cut from the board? How long was the piece of the board that was left?

5. Sue had 8 cookies. She divided them equally among 3 girls. Draw a picture to show how many cookies each girl received.

Answer these questions about the left-over part in the problems above.

6. In which problem was the left-over part divided?

7. In which problem was the left-over part a remainder that could not be used as a whole?

8. In which problem did you have to think of the remainder as one more whole?

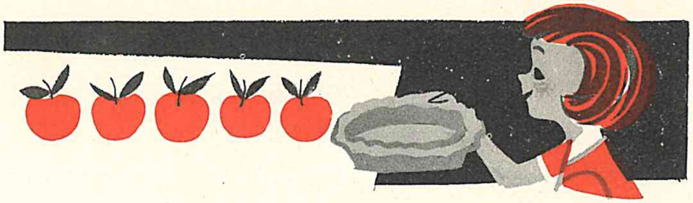
9. Joan had 15 friends at a party in her home. She seated 4 friends at each table. How many tables did she need for the 15 friends? In this problem what did you do about the remainder?

10. Jane had a piece of ribbon that was 36 inches long. She cut the ribbon into pieces that were 5 inches long. How many 5-inch pieces did Jane have? In this problem, what do you do about the remainder?

11. Jim's class was going to march by 3's in a clean-up parade. There were 26 children in Jim's class. Can 26 children be divided into threes without having some children left over? Would it be sensible to divide the left-over part into fractions in this problem? Explain your answer.

12. Divide 9 oranges equally among 4 children.

No Pencils, Please!



1. If 5 apples will fill one piecrust, how many apples will Jane need to make 4 pies?

2. Mrs. Jones bought a package containing 48 tea bags. She said her family uses 4 tea bags a day. In how many days will her family use the 48 tea bags?

3. Four boys together earned 96¢ selling old newspapers. If they share the money equally, how many cents will each boy get?

4. Tom has 8 papers to fasten to the bulletin board. He has 32 thumbtacks. How many thumbtacks can he use for each paper?

5. The teacher divided 81 helper cards equally among 9 children. How many cards did each child receive?

6. Jerry wants to write 35 spelling words in 5 equal columns. How many words should he write in a column?

7. What will 9 candy bars cost at 9¢ each?

8. Jack is saving to buy a key ring costing 50¢. He has already saved a quarter. How much more must he save to get the key ring?

9. Ann bought a dozen oranges. She found that $\frac{1}{6}$ of them were bad. How many oranges were bad?

10. Sue had 1 dozen eggs. She used $\frac{1}{4}$ of them to make cookies. How many eggs did she use?

Mixed Practice

Try this review. If you need help, study the pages given in parentheses after the example.

1. $\begin{array}{r}649\\348\\+275\\\hline\end{array}$ (16) 2. $\begin{array}{r}\$5.26\\.63\\+.05\\\hline\end{array}$ (23)

3. $\begin{array}{r}960\\-52\\\hline\end{array}$ (50) 4. $\begin{array}{r}\$6.87\\-.40\\\hline\end{array}$ (51)

5. $\$25.18-\$1.75$ (51)

6. $24+452+5+276$ (16)

7. $\begin{array}{r}387\\\times 9\\\hline\end{array}$ (62) $\begin{array}{r}697\\\times 7\\\hline\end{array}$ (75)

8. $5\overline{)968}$ (100) $7\overline{)259}$ (117)

9. $6\overline{)874}$ (111) $8\overline{)285}$ (123)

Review Problems

1. Sam has saved $7.85. How much more must he save to buy a pair of shoes costing $10.00?

2. Sue spent $.75 for a scarf and $2.98 for an umbrella. How much did she pay for both of these?

3. Jim bought a billfold that cost $2.95. He gave the clerk a 5-dollar bill. How much change should Jim get?

4. Don wants to buy 5 records for his record player. If each record costs $1.35, what will Don pay for 5 records?

5. Joan made 144 cookies. She said $\frac{1}{4}$ of the cookies were gingersnaps. How many gingersnaps did she make?

6. A baker baked 360 doughnuts. He said $\frac{1}{6}$ of these were jelly doughnuts. How many jelly doughnuts did he make?

7. Nine children at a picnic wanted to share 36 sandwiches equally. How many sandwiches did each child get?

8. John saved 375 soap wrappers. He sent them to the soap company, and he got 3 press-top writing pens in return. How many wrappers did John have to send for each pen?

9. Nancy made a bowl of cookie batter. She wanted to have 108 cookies when she was finished. If she put 9 cookies in a row, how many rows did she have to make?

10. Tom sawed a 56-inch strip of wood into pieces 8 inches long. How many pieces did he make?

11. Don found the answer to problem 4 by multiplying. Show how he could find his answer in another way.

12. Make a dot drawing to show how the 9 children in problem 7 should share the 36 sandwiches.

13. Check your answer to problem 9 above by drawing 108 cookies in rows of 9 cookies each.

14. Make a number line drawing to show that your answer to problem 10 above is correct.

15. How many 9-in. badges can Ann cut from a yard of ribbon? Draw a foot ruler and show that your answer is correct.

16. Mrs. Smith needs 18 in. of cloth to finish a dress. What part of a yard does she need? Use a number line to find your answer.

17. Mrs. Smith's cloth cost 75¢. What change will she get from $5?

Answers Only

1. A toy auto in the smallest size costs 15¢. Jimmy has 9¢. How much more does he need to buy a toy auto?

2. A small tablet costs 12¢. A large one costs 18¢. What is the difference in the cost?

3. Tom bought 16 marbles. Bob bought 9 marbles. How many more did Tom buy than Bob?

4. Jack had 15¢. He spent 8¢ for a candy bar. How much money did he have left?

5. Nancy spent 5¢ for a pencil. Then she bought a tablet for 12¢. How much did she spend?

6. Mary bought a box of crayons for 15¢ and a coloring book for 9¢. How much did she pay for both?

7. Oranges cost 9¢ each. How much did Joy pay for 4 oranges?

8. A stick of candy costs 5¢. How many sticks of candy can Ray get for 25¢?

9. Mary paid 25¢ for a sandwich, 5¢ for a candy bar, and 10¢ for a bag of peanuts. How much did she spend?

10. John bought a popcorn ball for 10¢, a sandwich for 25¢, and an apple for 5¢. How much did he spend?

11. Jane saw some cookies. They cost 7¢ each. How much must she pay for 5 of them?

12. Paul has 23 pennies. Can he buy two candy bars which cost 11¢ each?

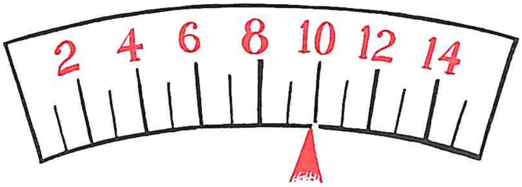
13. A package of cup cakes costs 8¢. How many packages can Katie buy with 40¢?

14. Ben paid 9¢ apiece for some cowboy figures. How much did he pay for 6 cowboy figures?

15. Ted has 50¢. How many balloons can he buy if they cost 6¢ apiece?

16. Andy has 25¢. How many pencils can he buy if the pencils cost 6¢ each?

How Well Have You Learned?



1. A newspaper article said heavy rains had raised the water in a river $\frac{1}{2}$ ft. How many inches had the river risen?

2. Write a division question in which the divisor is 9 and the dividend is 387. Find the quotient.

3. If you know the basic multiplication fact $6 \times 9 = 54$, what other basic multiplication fact do you also know?

4. Use the numbers 56, 8, and 7 to write four related basic facts.

5. On a number line, show that $36 \div 9 = 4$ and $36 \div 4 = 9$ are related facts.

6. Which is longer, 3 ft. of rope or a piece of rope that is 36 in. long?

7. On a breakfast-food package the weight is given as 12 oz. Does this box hold more or less than 1 lb. of breakfast food?

8. Which of the following amounts of money shows $3.68 rounded to the nearest dollar?

$3.50 $4.00 $3.00

9. Mr. James said he was going on a trip of about 500 miles. If the exact distance he was going to travel was 493 miles, could you say he had rounded the distance to the nearest ten miles? To the nearest one hundred miles?

10. Ann's Brownie troop was going on a trip. The plan was to have 4 Brownies ride in each automobile. How many automobiles would it take to carry 23 Brownies? Explain your answer.

11. Tom wants to buy $\frac{1}{2}$ lb. of potato chips. Should he get a package marked 6 oz., 10 oz., or 8 oz.?

12. What must you do to have the number 350 mean three dollars and fifty cents?

13. Gary counted 31 apples in one basket and 48 apples in another. If Gary wanted to estimate the total number of apples, to what would he change 31 and 48?

14. Would you use yards or miles to measure the distance you ride on your bicycle in a half day of riding?

Helping Yourself

1. A good way to improve your work is to go over the five Helping Yourself pages that come earlier in this book. (See pages 27, 53, 83, 107, and 133.)

Each time you find something on these pages that you do not remember or understand, study the helping page shown in parentheses beside the work you are trying to do.

2. A second way to improve your work is to do each Improvement Test over again. (See pages 17, 45, 78, 105, 120, and 143.) See if the work you do this time is better than the first time you took the test. If you find you need practice on certain kinds of examples, find such practice on Special Practice pages at the end of this book. (Pages 329-345)

If you have trouble answering questions 3, 4, 5, and 6, make up a problem that will help you give the right answer.

3. There are 297 boys in a certain school. If I also know how many girls there are, how can I find how many children there are in the school?

4. If you know the price of one ticket to the picture show, what must you do to find the price of 5 tickets?

5. What must you do to divide a sack of marbles equally among 4 boys?

6. I know how many sheets of paper I had. I know how many sheets I gave away. What must I do to find how many sheets I have left?

7. Sue made up this problem: Jerry had 240 marbles. He divided them equally among 4 boys. How many marbles did each boy get?

Can you tell which of the questions above Sue was trying to explain by making up this problem?

For each of the following numberless problems, make up a problem having sensible numbers.

8. I have a box of apples. I want to divide the apples equally among the players on my baseball team. How many apples will each player get?

9. I bought some bread, some meat, and some milk. How much did I spend?

10. I spent a part of my money. How much did I spend?

How Well Are You Doing?

1. There are a dozen pencils in a box. How many pencils will there be in 5 such boxes?

2. Jim has saved 169 bottle caps. Tom has saved 94 bottle caps. How many more caps must Tom save to have as many as Jim?

3. Gary had 20 examples to do. He said he wanted to get $\frac{1}{4}$ of them done before noon. How many did he want to do before noon?

4. Ann says she has saved $1.35 in pennies. How many pennies has she saved?

5. Six boys together caught 42 fish. If they share the fish equally, how many fish will each boy get?

6. There were 150 books to be taken to the school library. Five boys each took an equal share and carried the books to the library. How many books did each boy take to the library?

7. The distance between two towns is 475 miles. How far has Mr. Jones driven when he says he has driven $\frac{1}{3}$ of this distance?

8. One sixth of the 750 children at the Franklin School are in the first grade. How many children are there in the first grade at this school?

9. How many sheets of paper are there in 9 packages, if there are 500 sheets in one package?

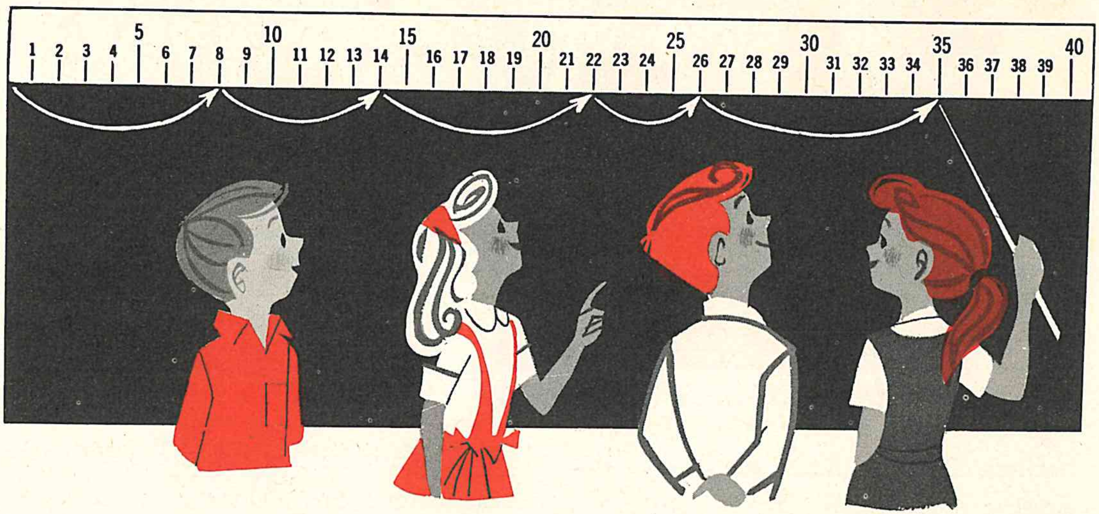
10. The material for making 5 pairs of curtains cost $25.50. How much did the material for 1 pair cost?

11. Joe paid $4.00 for some bicycle tires, 59¢ for a bicycle lock, and 6¢ for a jewel reflector. How much did he have to pay for all of the things?

12. Mr. Smith decided to get a $19.95 battery for his automobile. The dealer gave him $2.50 for his old battery. How much cash did Mr. Smith have to pay for his new battery?

13. Eight boys went on a camping trip for two weeks. Their expenses for the trip were $76.80. To share the expenses equally, each boy must pay how much?

14. There are 42 pages to fill in Jack's trading-stamp book. He has 29 pages filled. How many pages has he left to fill?



Adding Correctly

Jack raises tropical fish. He told Ruth that he thought he had 35 fish in all. He said he had 8 angel fish, 6 guppies, 8 swordtails, 4 mollies, and 9 blue neons.

1. If Jack were at home near his fish, how could he check his addition, shown below?

$$8+6+8+4+9=35$$

2. Since Jack is at school, he must use other ways to check his addition. Explain the check that Ruth is showing him above.

3. Bill suggested the check in the next column. Why is adding in the opposite direction a better check than adding twice in the same direction?

4. Explain the work that Bill did.

BILL

ADD		CHECK	
8	THINK	8	→35 ↑
6	→14	6	→27
8	→22	8	→21
4	→26	4	→13
+9	→35 ↓	+9	THINK
35			

Ann said she always found the mark-out check a sure way to check her addition.

Jack had forgotten how to use the mark-out check. The next page shows how Ann reviewed this check.

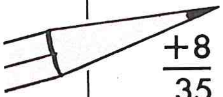
Using the Mark-Out Check in Addition

Here is how Ann reviewed the mark-out check for Jack. She said the mark-out check is easy if you remember five easy steps.

1. Why do you think Ann held her pencil over 35 when she added in Step Five?

2. The children in the picture are playing store. Choose four things for each child to buy. What will the bill be for each child?

Use the mark-out check to make sure that you added the bill correctly.

STEP ONE	STEP TWO	STEP THREE	STEP FOUR	STEP FIVE
Add.	Mark out sum.	Mark out first addend.	Write crossed-out addend under crossed-out sum.	Add figures that are not crossed out.
$\left.\begin{array}{r}8\\6\\8\\4\\+9\end{array}\right\}$addends 35 sum	8 6 8 4 +9 $\cancel{35}$	$\cancel{8}$ 6 8 4 +9 $\cancel{35}$	$\cancel{8}$ 6 8 4 +9 $\cancel{35}$ 8	 $\cancel{8}$ 6 8 4 +9 +8 35

Doing Column Addition

▶ Copy in straight columns. Add. Use the mark-out check to be sure you added correctly.

1.	3	2	7	6	3
	4	6	3	0	8
	+5	+7	+4	+9	+7

2.	2	8	7	2	6
	3	3	8	5	4
	4	6	3	2	7
	+9	+4	+7	+9	+6

3.	4	3	6	3	2
	8	3	5	7	2
	6	2	4	0	9
	9	1	9	7	5
	+3	+1	+7	+3	+8

4.	4	2	5	4	3
	7	6	1	6	8
	3	8	9	8	5
	5	5	3	7	4
	+0	+4	+6	+3	+5

5.	5¢	2¢	4¢	7¢	3
	6¢	9¢	3¢	3¢	8
	4¢	6¢	7¢	2¢	2
	4¢	4¢	4¢	6¢	4
	+5¢	+3¢	+6¢	+1¢	+5

6. Don paid 5¢ for an apple, 9¢ for a sandwich, 6¢ for a candy bar, and 7¢ for milk. How much did he spend for his lunch?

7. Joan paid 9¢ for a sandwich, 5¢ for cookies, 7¢ for milk, and 8¢ for a salad. What did her lunch cost?

8. Bill wanted to buy 18 bottles of soda. He told the clerk to give him 6 orange, 3 lemon, 7 strawberry, and 2 grape flavors. Show that Bill ordered exactly the right number of bottles of soda.

9. In a game, Joe scored 4 points, 5 points, 6 points, 2 points, and 3 points. What was his total score?

10. For a doll fair, Sue's Brownie troop dressed 4 Indian dolls, 8 dancing dolls, 2 bride dolls, and 6 walking dolls. How many dolls did her troop dress for the fair?

11. Jim's Cub Den brought books for the Den's library. Jim brought 6 books. Joe brought 9 books. Bill brought 4 books. A Den mother brought 5 books. Together these persons brought how many books?

12. Tom's mother told him to go to the post office and get some stamps. He got 4 two-cent stamps, 6 air-mail stamps, 5 three-cent stamps, and 5 special-delivery stamps. How many stamps did he get?

13. In four days, Joan missed 5 words, 2 words, 1 word, and 2 words. How many words did she miss in the four days?

Ones, Tens, and Hundreds

The Longfellow School was giving a show to make money to buy a TV set for the school. The pupils sold 295 tickets on Monday, 135 tickets on Tuesday, 64 tickets on Wednesday, and 204 tickets on Thursday. Mary and Bob wanted to find out how many tickets had been sold.

1. Mary said, "To get a TV set, we must sell 950 tickets. We have sold more tickets than we needed to sell." Bob said Mary was wrong. Can you tell why?

MARY

$$\begin{array}{r} 295 \\ 135 \\ 64 \\ +204 \\ \hline 3110 \end{array} \quad \text{X}$$

BOB

$$\begin{array}{r} 295 \\ 135 \\ 64 \\ +204 \\ \hline 698 \end{array}$$

2. How could Bob tell that the 6 in 64 should be written under the 3 in 135?

3. Which number that Bob wrote had no tens in tens place? How is this shown in writing the number?

Jerry said he knew that Mary's sum was wrong because he rounded the numbers to the nearest hundred and estimated the sum.

300 + 100 + 100 + 200 = 700

4. Explain how Jerry thought when he rounded 295 to 300.

5. Tell how to round 135 to the nearest hundred. To round 64. To round 204.

6. How close is Jerry's estimated answer to Bob's exact answer?

7. The numbers 842 and 428 are written with the same figures. How does it happen that these two numbers do not have the same value?

8. You can think of 842 in five different ways. Give the right answer wherever you find a question mark.

842 means ? hundreds ? tens ? ones
842 means 800 + 40 + 2
842 means 84 tens 2 ones
842 means ? ones
842 can be rounded to ? hundreds

9. How can you tell quickly that 842 is larger than 428?

10. Write a number that means 36 tens and 9 ones.

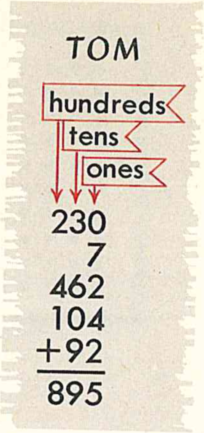
11. Add: 74 + 9 + 193 + 429 + 34.

If you think of the place value of a figure, you will know where to write the figures in column addition.

12. Look at Tom's work. Why did Tom write the 7 in the first column at his right?

13. How could Tom tell where to begin writing 92 in his addition?

14. What is the value of the 4 in 462?



Copy correctly in columns. Add.

15. 6, 87, 243, 127, 8
16. 523, 45, 3, 7, 59
17. 11, 462, 261, 123, 7
18. 423, 72, 6, 27, 15
19. 13, 452, 1, 19, 266
20. 300, 30, 303, 3, 3
21. 520, 103, 230, 26
22. 6, 35, 400, 22, 230

Addition Problems

1. Jack's basketball team played five games last month. Their scores for these games were 9, 23, 15, 24, and 29. What was the total score for the month?

2. Bill and Don checked the books in the room library. They counted 123 story books, 14 science books, and 9 travel books. How many books were there in all?

3. Tom helped the grocer count his stock. Tom counted 48 cans of pears, 72 cans of pineapple, 4 cans of plums, and 114 cans of peaches. How many cans of fruit were there in all?

4. Jim keeps a record of the magazines he delivers to customers. His record shows that he delivered 125 "Journals," 74 "TV Guides," 14 "Science Reviews," and 8 "Guides to Good Farming." The record shows he delivered how many magazines?

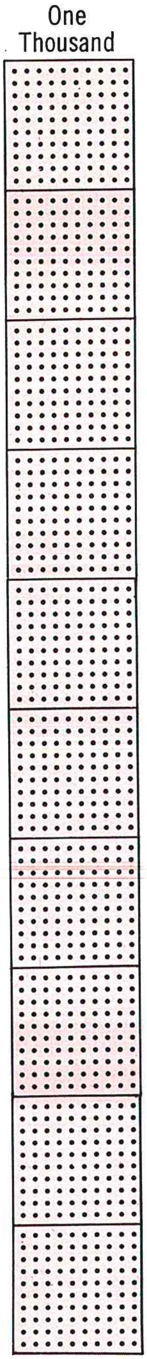
5. The storekeeper said that he sold 23 gallons of ice cream on Thursday, 45 gallons on Friday, and 33 gallons on Saturday. How many gallons did he sell in the three days?

6. How many chairs will you need to seat 35 children, 8 visitors, 2 teachers, and the principal?

Copy in columns. Add.

7. 26, 78, 92, 11, 210
8. 224, 309, 130, 216
9. 59, 62, 48, 5, 7

Reading and Writing Thousands



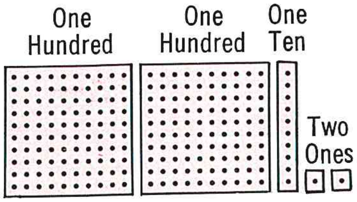
A report said that 1212 library books had been borrowed from the school library in one month. To get an idea of how many 1212 books would be, the class used peg boards.

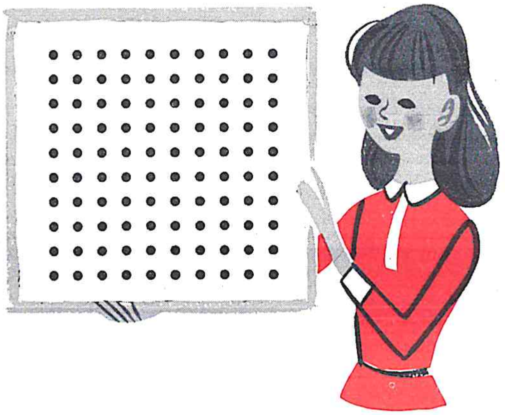
1. Look at the picture at the top of the second column on this page. How many pegs can you put in 1 peg board?

2. To show the 1000 in 1212, the class decided to use 10 peg boards. How many pegs will it take to fill 10 peg boards? Use addition to find your answer.

3. Jack said that the 10 peg boards show that 10 × 100 = 1000. Explain how he found this multiplication fact.

4. After you show the 1000 in 1212, how many hundreds will you have to show?





5. To show the hundreds in hundreds place in 1212, how many peg boards must be used?

6. In writing 1212, the figure 1 is used twice. How are these 1's different in value? The picture of 1212 will help you.

7. In writing 1212, the figure 2 is used twice. How are these 2's different in value?

8. How many 10's equal 100?

9. How many 100's equal 1000?

10. The number 1212 may be written 1212, or 1,212. Why do you think that the comma is usually omitted in a four-figure number?

Use figures. Write these numbers. Place a comma between thousands and hundreds in numbers that have five or more figures.

11. One thousand four.

12. Thirty-seven thousand three hundred ninety-two.

13. Six hundred seventy-five thousand two hundred eighty.

14. Twelve thousand three hundred four.

15. Write the next five numbers after 385,798.

16. Write the next five numbers after 147,997.

Copy. Here use a comma in each number.

17. 9740 900184 110294

18. 501005 2546 666666

19. Which number in rows 17-18 is the smallest number? The largest number?

20. Which number in rows 17-18 is nearest 1000? 10,000? 100,000? 500,000?

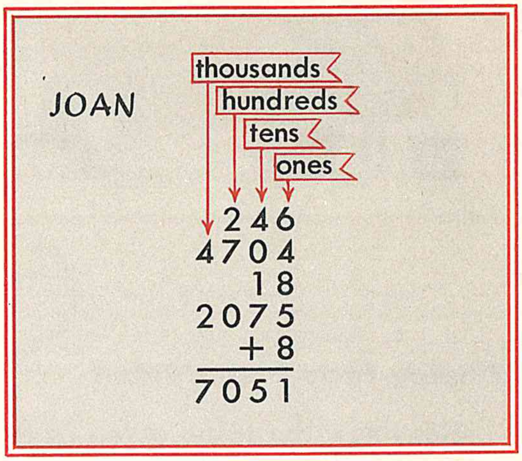
21. Count from 1250 to 2000 by 100's.

22. Count from 66,666 to 72,666 by 1000's.

23. 100,000 equals how many 1000's?

24. What is the next number after 99,999?

25. Joan wrote on the chalkboard the addition in the box in the next column. How is this addition different from Tom's on page 165?



Addition Practice

Copy. Add.

1. 557, 4652, 1685, 9, 35

2. 15, 89, 4652, 3100, 58

3.

$$\begin{array}{rrr} 88 & 463 & 2957 \\ 509 & 285 & 4 \\ 3820 & 903 & 3021 \\ 732 & 405 & 1000 \\ +4231 & +127 & +58 \\ \hline \end{array}$$

4.

$$\begin{array}{rrr} 1245 & 2900 & 87 \\ 2530 & 44 & 29 \\ 3008 & 736 & 132 \\ 1000 & 1423 & 15 \\ +2890 & +9 & +989 \\ \hline \end{array}$$

5.

$$\begin{array}{rrr} 447 & 3502 & 2610 \\ 216 & 1207 & 299 \\ 933 & 2545 & 12 \\ 477 & 1200 & 821 \\ +320 & +1158 & +1638 \\ \hline \end{array}$$

Finding Facts from a Table

Gary saw the table given at the bottom of this page in a travel folder. He took the folder to school for his arithmetic class to study.

Study the table carefully. Then answer these questions.

1. How far do you ride if you drive from Detroit to New York? From Chicago to St. Louis? From Boston to Cincinnati?

2. In some spaces only a zero is written. What do these zeros mean?

3. Some numbers like 880, 990, 221, and others appear in two different places on the table. Can you tell why this happens?

4. Which distance on the table is over 1000 miles? Nearest to 1000 miles? About 500 miles?

5. What is the shortest distance shown on the table?

6. Would it be right to say that 0 miles is the shortest distance shown on the table? What does

DISTANCES BETWEEN CITIES

FROM↓ TO→	BOSTON	CHICAGO	CINCINNATI	DETROIT	NEW YORK	ST. LOUIS
BOSTON	0	990	880	718	221	1193
CHICAGO	990	0	294	272	831	294
CINCINNATI	880	294	0	254	660	343
DETROIT	718	272	254	0	631	526
NEW YORK	221	831	660	631	0	976
ST. LOUIS	1193	294	343	526	976	0

the number 0 mean when it is used alone in one of the spaces in the chart?

7. Does the figure 0 mean something different when it is used in 990 on this chart? Explain your answer.

The class made these subtraction problems from facts given on the chart. Use the chart and answer the problems the class made.

8. Which is longer, a trip from New York to Chicago or a trip from Boston to Cincinnati? How much longer?

9. Mr. Jones drove from Boston to Cincinnati. Mr. Smith drove from Boston to St. Louis. How many more miles did Mr. Smith drive?

10. Bill's father was driving from New York to Chicago. After he had driven 390 miles, how many more miles did he have to drive?

11. Is St. Louis nearer to Cincinnati or to Chicago? How many miles nearer?

Borrowing in Subtraction

Jim had to answer these subtraction questions when he worked the problems on this page.

A. $\begin{array}{r} 880 \\ -831 \\ \hline \end{array}$ **B.** $\begin{array}{r} 343 \\ -294 \\ \hline \end{array}$

C. $\begin{array}{r} 831 \\ -390 \\ \hline \end{array}$ **D.** $\begin{array}{r} 1193 \\ -880 \\ \hline \end{array}$

1. In which examples did Jim have to change 1 ten to ones before he could subtract?

2. In which examples did he have to change 1 hundred to tens?

3. In which example did he have to change 1 thousand to hundreds? How many hundreds did he have in his number after he had changed 1 thousand to hundreds?

4. In which example did Jim have to change both 1 ten to ones and 1 hundred to tens?

5. Sue did the following subtraction. Tell how she got the ghost figures as she was thinking.

SUE

Subtraction Question	Subtraction
$\begin{array}{r} 923 \\ -286 \\ \hline \end{array}$	$\begin{array}{rrrr} & 8 & 11 & 13 \\ & 9 & 2 & 3 \\ - & 2 & 8 & 6 \\ \hline & 6 & 3 & 7 \end{array}$

Checking Subtraction

1. Study the check for subtraction that is explained on page 48.

Use this subtraction check. Find out if all of Carl's answers are correct.

▶ Copy. Find the differences.

2. $\begin{array}{r} 545 \\ -28 \\ \hline \end{array}$ $\quad$ $\begin{array}{r} 635 \\ -97 \\ \hline \end{array}$ $\quad$ $\begin{array}{r} 436 \\ -370 \\ \hline \end{array}$ $\quad$ $\begin{array}{r} 541 \\ -469 \\ \hline \end{array}$

3. $\begin{array}{r} 212 \\ -48 \\ \hline \end{array}$ $\quad$ $\begin{array}{r} 615 \\ -547 \\ \hline \end{array}$ $\quad$ $\begin{array}{r} 9103 \\ -5006 \\ \hline \end{array}$ $\quad$ $\begin{array}{r} 4004 \\ -2009 \\ \hline \end{array}$

CARL

A. $\begin{array}{r} 56 \\ -8 \\ \hline 48 \end{array}$? $\quad$ $\begin{array}{r} 48 \\ -6 \\ \hline 42 \end{array}$?

B. $\begin{array}{r} 89 \\ -5 \\ \hline 84 \end{array}$? $\quad$ $\begin{array}{r} 367 \\ -83 \\ \hline 284 \end{array}$?

C. $\begin{array}{r} 716 \\ -347 \\ \hline 369 \end{array}$? $\quad$ $\begin{array}{r} 310 \\ -192 \\ \hline 118 \end{array}$?

D. $\begin{array}{r} 517 \\ -209 \\ \hline 308 \end{array}$? $\quad$ $\begin{array}{r} 917 \\ -639 \\ \hline 278 \end{array}$?

E. $\begin{array}{r} 5016 \\ -3259 \\ \hline 1757 \end{array}$? $\quad$ $\begin{array}{r} 6104 \\ -2825 \\ \hline 3279 \end{array}$?

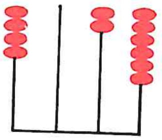
F. $\begin{array}{r} 8003 \\ -1536 \\ \hline 6467 \end{array}$? $\quad$ $\begin{array}{r} 7018 \\ -2109 \\ \hline 4909 \end{array}$?

No Pencils, Please!

1. Where would you place the comma in 165234?

2. How many zeros would you use to write four hundred thousand with figures?

3. What number is shown on the abacus pictured here?



4. In the number twenty-five thousand two hundred four, what figure is in tens place?

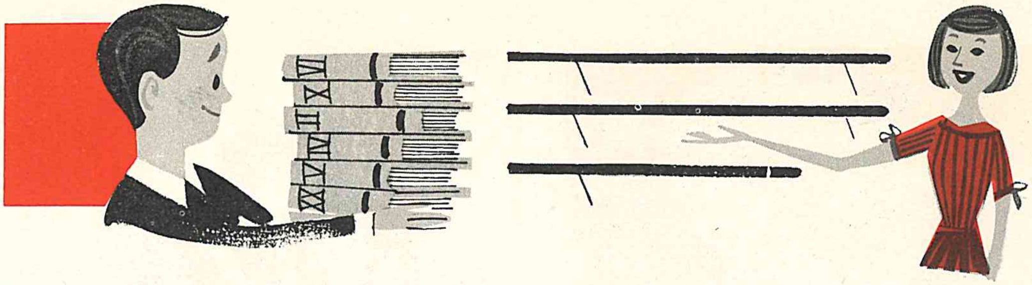
5. Count by hundreds from 500 to 1000.

6. Ten hundred is the same as how many thousand?

7. What is the next number following 999? 9,999? 99,999?

8. Count by thousands from 89,000 to 100,000.

9. If 274 + 123 = 397, then 397 − 274 = ☐. $\quad$ 397 − 123 = ☐.

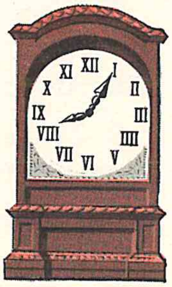


Numbers Written with Roman Numerals

The teacher told Jerry to put a set of reference books on a shelf. She said, "Put them in order according to the numbers on the books."

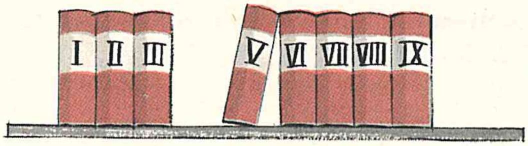
Jerry didn't know what to do. The numbers on the books were written with Roman numerals.

Then he thought of the Roman numbers on a clock face at home.



1. How did the clock face help Jerry?

Jerry found and put these books in this order.



2. Jerry could not find a book numbered "IIII." Can you tell why?

3. In Roman numbers, IV means 1 from 5, or ?. What does IX mean?

4. How many different letters did the Romans use when they wrote the numbers from 1 through 10?

I II III IV V
VI VII VIII IX X

In numbers written with Roman numerals, each I = 1. Each V = 5. Each X = 10. You know that IV = 4 and IX = 9.

5. Write these Roman numbers the way we write our numbers.

XXX XIV XXIX XVIII XXXIII

6. Copy this chart. Write one of our numbers or a Roman number in place of each question mark.

X 10	XX . . . 20	XXX . . 30
XI . . . . ?	XXI . . . ?	XXXI . ?
? 12	? 22	? 32
? 13	? 23	? 33
XIV . . ?	XXIV . ?	XXXIV ?
XV . . . ?	XXV . . ?	XXXV ?
XVI . . 16	XXVI . ?	? 36
? 17	XXVII ?	? 37
? 18	? 28	? 38
XIX . . . 19	? 29	XXXIX ?

Roman Numbers Through Fifty

The painter told Sue that there were fifty screens to paint on her house. Sue said, "How will you ever know what screen belongs on each window when you put the screens back again?"

"I number the screen and the window where the screen belongs. I stamp Roman numbers into the wood with my hammer and chisel," said the painter.

1. Why is it a good idea to stamp numbers with a chisel instead of using a lead pencil?

2. Why is it a good idea to use Roman numerals instead of our figures to make numbers as the painter does?

3. At the bottom of the page, all the Roman numbers that the painter used are shown. The painter used I, V, and X as we have been doing. What new letter did he use?

4. What figures would you use to write the meaning of the new letter in our way?

5. IV means 1 from 5, or 4. IX means 1 from 10, or 9. What do you think XL means?

1 **In some Roman numbers, only one letter is used and it is repeated, as XXX, III, XX, and II. The number is the sum of the value of the letters. III = 1 + 1 + 1 = 3.**

6. XXX = 10 + 10 + 10 = ?

I II III IV V VI VII VIII IX X XI XII XIII XIV XV
XVI XVII XVIII XIX XX XXI XXII XXIII XXIV XXV
XXVI XXVII XXVIII XXIX XXX XXXI XXXII XXXIII
XXXIV XXXV XXXVI XXXVII XXXVIII XXXIX XL
XLI XLII XLIII XLIV XLV XLVI XLVII XLVIII XLIX L

2 In most Roman numbers, a letter is followed by letters of the **same or smaller** value. The number is the **sum** of the value of the letters. XXXVIII = 10 + 10 + 10 + 5 + 1 + 1 + 1 = 38.

7. XXXI = ? XV = ? XXXV = ?

3 In some Roman numbers, a letter of **less value** comes **before** a letter of **greater value**, as IV, IX, XL. In these numbers, the smaller number is always **subtracted** from the larger number. XL = 50 − 10 = 40.

8. Write these numbers using our figures.

XLIII XIX XXIX XLIX XLIV

Write the following numbers using Roman numerals.

9. 23 24 15 40 45 27

10. 39 29 42 45 50 49

11. Write the numbers from 39 through 49 using Roman numerals.

12. Tell about places where you have seen Roman numbers used.

How Quickly Can You Answer?

Write answers quickly on folded paper. If you are slow, study the pages given in parentheses.

▶ Write the sums. (321)

1.	9	8	9	7	8
	+4	+3	+6	+9	+5
2.	7	4	5	7	8
	+7	+8	+9	+5	+7
3.	9	7	6	9	6
	+7	+4	+6	+8	+7
4.	8	7	9	8	6
	+9	+8	+5	+8	+9
5.	6	5	9	5	9
	+8	+6	+9	+8	+3

▶ Write the differences. (323)

6.	13	15	16	14	15
	−8	−9	−8	−5	−8
7.	16	11	12	17	13
	−7	−4	−6	−8	−7
8.	11	15	12	14	12
	−6	−7	−5	−7	−8
9.	16	13	14	15	11
	−9	−8	−8	−6	−3
10.	17	18	14	13	12
	−9	−9	−9	−4	−9

For more practice in adding, use page 322. For more practice in subtracting, use page 324.

Multiplying a Four-Place Number

Jack says his father owns a truck which can carry 3 T. The teacher asked the class to find how many pounds this would be.

Here is how four of the class found the answer.

MARY

$$\begin{array}{r} 2 \text{ thousand} \\ 2 \text{ thousand} \\ +2 \text{ thousand} \\ \hline 6 \text{ thousand} \end{array}$$

DON

$$\begin{array}{r} 2 \text{ thousand} \\ \times 3 \quad\quad\quad\quad \\ \hline 6 \text{ thousand} \end{array}$$

JIM

$$\begin{array}{r} 2000 \\ 2000 \\ +2000 \\ \hline 6000 \end{array}$$

CAROL

$$\begin{array}{r} 2000 \\ \times 3 \\ \hline 6000 \end{array}$$

1. Why did each child begin with 2000?

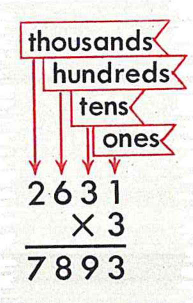
2. In what way is Don's work like Mary's? How is it different?

3. How is Jim's work like Mary's? How is it different?

4. Carol and Don both multiplied to find their answer. In what way is Carol's work different from Don's?

5. Carol says she can check her answer by adding. Which of the four children's work shows clearly how Carol can check her answer?

6. Use addition and check the answer in the multiplication example at the right.



7. Explain how the 7 in the product 7893 was found.

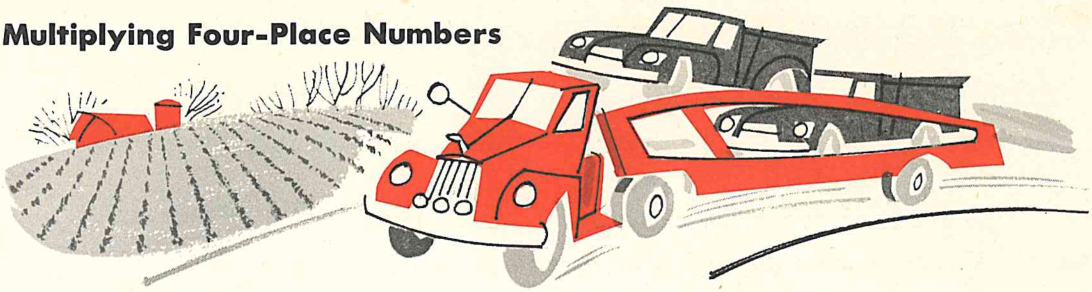
8. Study the following multiplication examples. In which example is 1 (thousand) carried to thousands place? In which example is 2 (thousands) carried to thousands place?

A.	B.	C.
4142 ×2 8284	1823 ×3 5469	2846 ×2 5692

Copy. Find the products.

9.	1384 ×4	2936 ×3	1435 ×6
10.	2635 ×3	1664 ×5	1324 ×7
11.	2349 ×4	4526 ×2	2845 ×3
12.	2553 ×3	3648 ×2	2316 ×4
13.	3616 ×2	1192 ×8	1678 ×4

Multiplying Four-Place Numbers



1. Each truck shown on the carrier in the picture weighs 3575 lb. How heavy is the load that the carrier now has? Finish the multiplication that Mary began.

MARY

$$\begin{array}{r} 3575 \\ \times 2 \\ \hline \boxed{?}\boxed{?}50 \end{array}$$

2. Mr. Dane owes two more payments on his car. If each payment is $35.75, how much does he still owe on his car? Finish the multiplication that Bob began.

BOB

$$\begin{array}{r} \$35.75 \\ \times 2 \\ \hline \boxed{?}\boxed{?}50 \end{array}$$

3. In what ways is Bob's multiplication example exactly like Mary's?

4. In what ways is Bob's multiplication example different from Mary's?

▶ Copy. Find the products.

5. 4×$23.86 3×$24.15

6. 2×$28.79 5×$14.38

7. 9×$10.15 7×$13.29

▶ Copy. Multiply. Check by multiplying a second time.

8.	$\begin{array}{r} 1672 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 3875 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 2646 \\ \times 3 \\ \hline \end{array}$
9.	$\begin{array}{r} 2069 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 1560 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 3198 \\ \times 3 \\ \hline \end{array}$
10.	$\begin{array}{r} 2476 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 2587 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 1485 \\ \times 6 \\ \hline \end{array}$
11.	$\begin{array}{r} \$12.25 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} \$29.98 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} \$27.56 \\ \times 3 \\ \hline \end{array}$

12. Mary said you multiply and you also add when you do a multiplication example like hers in the first column on this page. Explain what Mary meant.

13. Write the four basic multiplication facts that Mary would use in doing her multiplication.

14. Here are some of the basic multiplication facts you used in rows 8-11 above. How fast can you write the products?

$$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$$

Practice That Will Make Multiplying Easy and Fast

All the basic multiplication questions are given on page 325. Study this page if you find you cannot give the products for the following multiplication questions as fast as you can write.

▶ Use folded paper. Write the answers.

$$1.\quad \begin{array}{r}9\\ \times 6\\ \hline\end{array}\quad \begin{array}{r}7\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}4\\ \times 9\\ \hline\end{array}\quad \begin{array}{r}9\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}3\\ \times 8\\ \hline\end{array}$$

$$2.\quad \begin{array}{r}7\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}9\\ \times 5\\ \hline\end{array}\quad \begin{array}{r}8\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}9\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}5\\ \times 7\\ \hline\end{array}$$

$$3.\quad \begin{array}{r}8\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}9\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}7\\ \times 9\\ \hline\end{array}\quad \begin{array}{r}7\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}9\\ \times 9\\ \hline\end{array}$$

$$4.\quad \begin{array}{r}7\\ \times 9\\ \hline\end{array}\quad \begin{array}{r}6\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}4\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}6\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}8\\ \times 9\\ \hline\end{array}$$

$$5.\quad \begin{array}{r}6\\ \times 9\\ \hline\end{array}\quad \begin{array}{r}7\\ \times 6\\ \hline\end{array}\quad \begin{array}{r}8\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}9\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}8\\ \times 6\\ \hline\end{array}$$

When Mary multiplied 3575 by 2, she used three times-and facts.

6. Give the numbers that belong in place of the question marks.

$2 \times 7 + 1 = ?$

$2 \times 5 + ? = ?$

$2 \times 3 + ? = ?$

MARY

$$\begin{array}{r}3575\\ \times 2\\ \hline 7150\end{array}$$

Learn to give times-and facts quickly. It will help you answer faster when you multiply and carry.

Write or say answers only.

7. $9 \times 2 + 5 = ?$ $\quad 7 \times 6 + 3 = ?$
8. $5 \times 4 + 1 = ?$ $\quad 8 \times 0 + 2 = ?$
9. $4 \times 9 + 2 = ?$ $\quad 6 \times 7 + 4 = ?$
10. $3 \times 3 + 1 = ?$ $\quad 7 \times 9 + 6 = ?$
11. $9 \times 0 + 5 = ?$ $\quad 9 \times 3 + 3 = ?$
12. $8 \times 9 + 7 = ?$ $\quad 8 \times 6 + 5 = ?$
13. $4 \times 2 + 3 = ?$ $\quad 8 \times 9 + 5 = ?$
14. $6 \times 5 + 5 = ?$ $\quad 7 \times 0 + 5 = ?$
15. $9 \times 1 + 4 = ?$ $\quad 9 \times 8 + 8 = ?$

▶ Copy. See if your practice has made your multiplying easier and quicker.

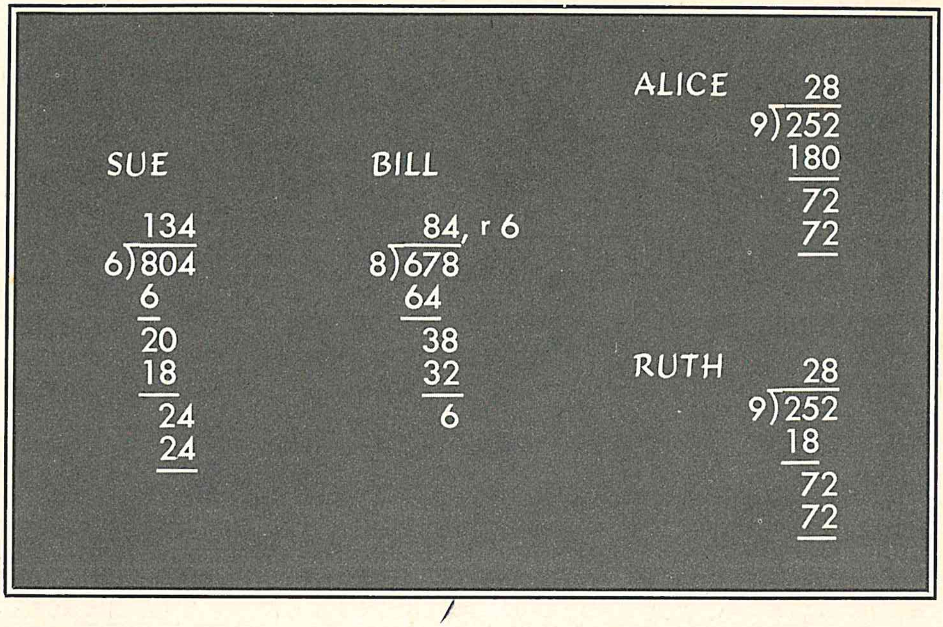
$$16.\quad \begin{array}{r}57\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}367\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}1536\\ \times 5\\ \hline\end{array}\quad \begin{array}{r}\$19.95\\ \times 3\\ \hline\end{array}$$

$$17.\quad \begin{array}{r}69\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}759\\ \times 9\\ \hline\end{array}\quad \begin{array}{r}2701\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}\$10.04\\ \times 9\\ \hline\end{array}$$

$$18.\quad \begin{array}{r}43\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}827\\ \times 6\\ \hline\end{array}\quad \begin{array}{r}3259\\ \times 3\\ \hline\end{array}\quad \begin{array}{r}\$42.65\\ \times 2\\ \hline\end{array}$$

$$19.\quad \begin{array}{r}90\\ \times 5\\ \hline\end{array}\quad \begin{array}{r}739\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}2004\\ \times 4\\ \hline\end{array}\quad \begin{array}{r}\$32.59\\ \times 3\\ \hline\end{array}$$

$$20.\quad \begin{array}{r}86\\ \times 9\\ \hline\end{array}\quad \begin{array}{r}496\\ \times 8\\ \hline\end{array}\quad \begin{array}{r}1109\\ \times 7\\ \hline\end{array}\quad \begin{array}{r}\$23.68\\ \times 4\\ \hline\end{array}$$



SUE

$$\begin{array}{r} 134 \\ 6\overline{)804} \\ \underline{6} \\ 20 \\ \underline{18} \\ 24 \\ \underline{24} \end{array}$$

BILL

$$\begin{array}{r} 84, \text{ r } 6 \\ 8\overline{)678} \\ \underline{64} \\ 38 \\ \underline{32} \\ 6 \end{array}$$

ALICE

$$\begin{array}{r} 28 \\ 9\overline{)252} \\ \underline{180} \\ 72 \\ \underline{72} \end{array}$$

RUTH

$$\begin{array}{r} 28 \\ 9\overline{)252} \\ \underline{18} \\ 72 \\ \underline{72} \end{array}$$

Questions About Division Examples

Gary was studying the division examples shown on the chalkboard above. Here are some of the questions he asked. Can you help him?

1. Sue wrote her first quotient figure over the first figure in her dividend. Why did Bill write his first quotient figure over the second figure in his dividend?

2. Alice and Ruth both have the same answer, but the work they wrote looks different. Can both of their division examples be marked right?

3. Bill said that his first partial dividend is 67. Why does he call it a "partial" dividend?

4. If Sue wanted to check her quotient, she could go over her work again. How else could she check her answer?

5. In what ways could Bill check his answer?

6. Alice said when you think $9\overline{)25}$ in her example, you are really dividing $9\overline{)250}$. What did she mean?

7. Bill wrote three figures when he found his quotient. He said this is not a 3-figure quotient. What did he mean?

8. How did Sue get the 20 that she used as her second partial dividend?

Division Practice

Copy. Find quotients. Write any left-over part as a remainder.

1. $5\overline{)155}$ $6\overline{)186}$ $6\overline{)240}$
2. $5\overline{)515}$ $4\overline{)172}$ $6\overline{)192}$
3. $6\overline{)156}$ $6\overline{)294}$ $8\overline{)248}$

4. $5\overline{)250}$ $7\overline{)217}$ $8\overline{)184}$
5. $8\overline{)448}$ $6\overline{)402}$ $7\overline{)903}$
6. $2\overline{)198}$ $2\overline{)87}$ $2\overline{)436}$

7. $3\overline{)129}$ $3\overline{)135}$ $3\overline{)172}$
8. $5\overline{)375}$ $4\overline{)840}$ $4\overline{)924}$
9. $4\overline{)735}$ $6\overline{)570}$ $9\overline{)763}$

10. $6\overline{)924}$ $2\overline{)417}$ $3\overline{)157}$
11. $6\overline{)396}$ $7\overline{)161}$ $2\overline{)136}$
12. $3\overline{)\$2.61}$ $4\overline{)\$2.24}$ $9\overline{)\$8.82}$

13. How are the examples in row 12 like the examples in the other rows? How are they different?

14. What basic division facts did you use when you divided 155 by 5? When you divided 156 by 6?

Write quotients on folded paper.

15. $3\overline{)18}$ $4\overline{)24}$ $8\overline{)16}$ $2\overline{)12}$
16. $5\overline{)10}$ $4\overline{)16}$ $9\overline{)63}$ $2\overline{)16}$
17. $9\overline{)18}$ $6\overline{)24}$ $3\overline{)15}$ $5\overline{)45}$

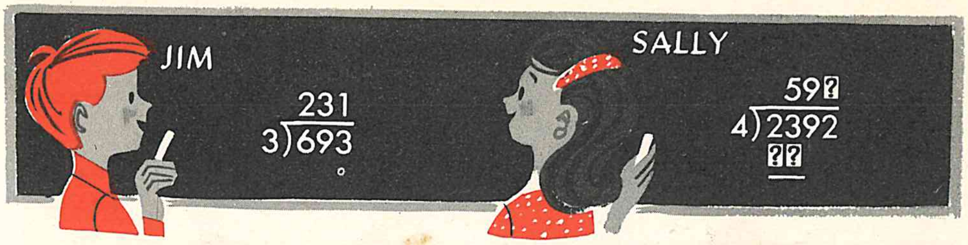
18. $7\overline{)14}$ $6\overline{)54}$ $6\overline{)12}$ $2\overline{)6}$
19. $8\overline{)24}$ $5\overline{)15}$ $4\overline{)20}$ $2\overline{)14}$
20. $4\overline{)4}$ $3\overline{)21}$ $4\overline{)12}$ $2\overline{)18}$

21. $3\overline{)12}$ $3\overline{)24}$ $3\overline{)9}$ $6\overline{)18}$
22. $9\overline{)54}$ $4\overline{)28}$ $3\overline{)27}$ $8\overline{)48}$
23. $5\overline{)30}$ $8\overline{)64}$ $6\overline{)30}$ $4\overline{)36}$

24. $8\overline{)56}$ $9\overline{)36}$ $5\overline{)25}$ $7\overline{)63}$
25. $5\overline{)35}$ $6\overline{)42}$ $5\overline{)40}$ $9\overline{)72}$
26. $6\overline{)36}$ $7\overline{)49}$ $8\overline{)32}$ $7\overline{)28}$

27. $9\overline{)81}$ $6\overline{)48}$ $9\overline{)27}$ $7\overline{)42}$
28. $7\overline{)35}$ $8\overline{)72}$ $9\overline{)45}$ $7\overline{)56}$
29. $4\overline{)32}$ $7\overline{)21}$ $5\overline{)20}$ $8\overline{)40}$

Study page 327 if you found you could not answer quickly.



Sally said Jim's division example is very easy. He has only to use a basic division fact to get a quotient figure.

She says her example is more difficult because she must divide, multiply, and subtract.

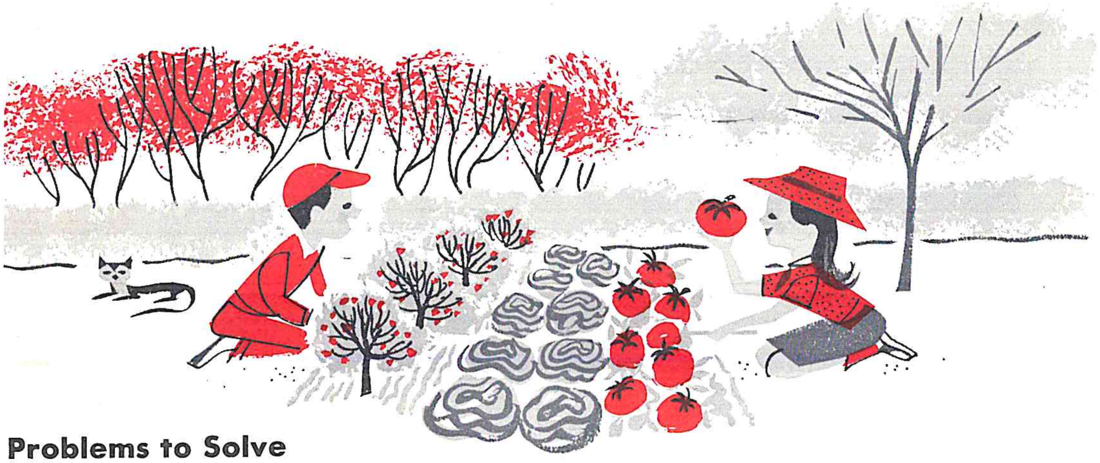
30. Is Sally right? Finish her division before you answer.

Practicing uneven divisions can help you do examples like Sally's faster and better. At the bottom of the page is an exercise to help you.

31. Say or write the quotients and remainders in the exercise at the bottom of the page. As you work, think of each black number divided by the number in color at the beginning of the row, like this:

2)5 2)17 2)11 2)9 2)14

2) 5	17	11	9	14	19	13	7	3
3) 21	13	19	11	26	22	16	10	28
4) 17	23	31	39	21	11	19	26	27
5) 3	9	49	33	21	47	15	38	32
6) 35	20	9	32	12	23	4	17	27
7) 8	16	20	25	30	35	41	43	29
8) 10	21	33	45	47	54	59	65	43
9) 15	22	28	35	42	45	30	50	60



Problems to Solve

Jack and Judy belonged to a 4-H Club. They chose gardening and selling as their project.

Here are some of the problems they had to work. See if you can solve their problems.

1. Judy had 144 tomato plants to set out in 8 equal rows. How many plants will she put in a row?

2. She expected to get about 15 good tomatoes from each plant. How many good tomatoes did she expect to get from a row of 8 plants?

3. Jack said it took 9 plants to grow one bushel of tomatoes. How many bushels did the 144 plants grow?

4. Jack sold some very large tomatoes at $.12 each. How much did he get for 24 such tomatoes?

5. The 4-H leader helped Judy can 3 bushels of tomatoes. They got 18 quart jars of tomatoes from each bushel. How many quart jars of tomatoes did they can in all?

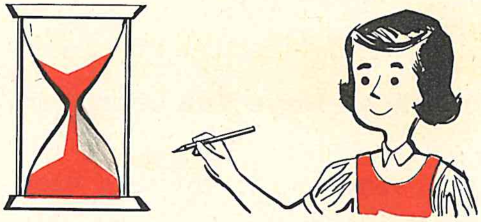
6. At the state fair, Judy sold the canned tomatoes. She got $16.20 for 54 quarts. Judy said it cost $8.01 to buy the tomato plants, the quart jars, and the things needed to can the tomatoes. How much of the $16.20 will she have left after she pays the cost of canning the tomatoes?

7. Jack planted 9 rows of cabbage plants with 26 plants in a row. How many cabbage plants was this?

8. Jack raised 207 good heads of cabbage. He sold $\frac{1}{3}$ of them at 15¢ each. How many heads did he sell at this price?

9. Jack sold 68 pints of red raspberries at $.35 a pint. How much did he get for the berries?

Measuring Improvement — Test 7



You have reviewed addition, subtraction, multiplication, and division in this unit. This test will help you find out how much the review has helped you.

Begin when the teacher tells you. The teacher will give the signal to stop.

Write sums on folded paper.

1.
$$\begin{array}{rrrr} 6 & 35 & 39 & \\ 5 & 26 & 8 & \$15.67 \\ 7 & 84 & 57 & .39 \\ 3 & 76 & 45 & 11.89 \\ +8 & +69 & +4 & +4.03 \\ \hline \end{array}$$

Write differences on folded paper.

2.
$$\begin{array}{rrrr} 17 & 15 & 18 & 16 \\ -8 & -6 & -9 & -7 \\ \hline \end{array}$$

3.
$$\begin{array}{rrr} 763 & 107 & 4638 \\ -429 & -48 & -2859 \\ \hline \end{array}$$

Write products on folded paper.

4.
$$\begin{array}{rrrr} 7 & 6 & 9 & 6 \\ \times 9 & \times 7 & \times 8 & \times 9 \\ \hline \end{array}$$

5.
$$\begin{array}{rrr} 87 & 368 & 402 \\ \times 6 & \times 7 & \times 8 \\ \hline \end{array}$$

Write quotients on folded paper.

6. $9\overline{)54}$ $5\overline{)45}$ $8\overline{)56}$ $7\overline{)63}$

7. $4\overline{)32}$ $7\overline{)49}$ $9\overline{)72}$ $9\overline{)81}$

Copy. Find the quotients. Write left-over parts as remainders.

8. $7\overline{)154}$ $8\overline{)208}$ $6\overline{)9762}$

9. $9\overline{)745}$ $8\overline{)356}$ $4\overline{)5791}$

Find out how many correct answers you have. Write the number of correct answers and the date on your paper. Also write the number of minutes you were given to do the test.

This is Improvement Test 7. Put it in your arithmetic notebook.

Special Helps

Work again any examples you missed. Check answers using these pages for help.

Addition check, page 162
Subtraction check, page 48
Multiplication check, page 57
Division checks, pages 103, 114

How Well Have You Learned?

1. What basic division fact do you think when you divide 41 by 9?

2. Make a dot drawing to show that 15 equals two 7's and 1 left over.

3. Say the even numbers from 2 through 24. Begin 2, 4, 6, . . . Will any of these even numbers have a remainder if divided by 2? Why can you answer this question without dividing each number by 2?

4. Say the odd numbers from 1 through 25. Begin 1, 3, 5, . . . Will these odd numbers have a remainder if divided by 2? Why can you answer this question without dividing each number by 2?

5. Write the number 452140 with words.

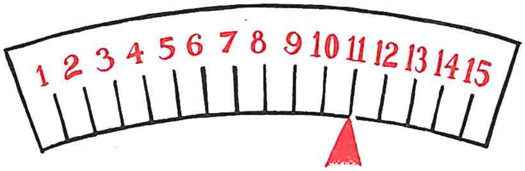
6. Copy these numbers. Put a comma in the correct place in each number.

98302 500680 29004 84830

7. Jerry wrote this addition example to check a product he had found. Write the multiplication example that Jerry was trying to check.

CHECK

$$\begin{array}{r} 1357 \\ 1357 \\ 1357 \\ +1357 \\ \hline 5428 \end{array}$$



Ann says you can write four related basic facts if you know one basic fact. Show what she means by writing a number in place of each question mark.

8.
$$\begin{array}{r} 9 \\ +? \\ \hline 14 \end{array} \qquad \begin{array}{r} ? \\ +9 \\ \hline 14 \end{array} \qquad \begin{array}{r} 14 \\ -? \\ \hline 9 \end{array} \qquad \begin{array}{r} 14 \\ -9 \\ \hline ? \end{array}$$

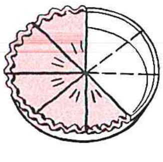
9.
$$\begin{array}{r} ? \\ \times 8 \\ \hline 56 \end{array} \qquad \begin{array}{r} 8 \\ \times ? \\ \hline 56 \end{array} \qquad ?\overline{)56}^{\,8} \qquad 8\overline{)56}^{\,?}$$

10. Draw 28 dots. Make $\frac{1}{4}$ of the dots red.

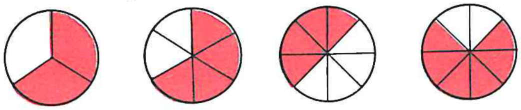
11. Copy. Place the first quotient figure in each division.

$8\overline{)292}$ $\quad 7\overline{)95}$ $\quad 6\overline{)1008}$

12. What part of this pie has been taken away? What part of the pie is left?



The pictures below will help you do examples 13-15.



13. Is $\frac{2}{3}$ more than $\frac{1}{2}$?

14. $\frac{6}{8}$ equals $\frac{?}{4}$.

15. $\frac{1}{2}$ equals $\frac{?}{8}$.

Helping Yourself

Divide. Check. If you find your quotient is not correct, study the pages referred to in color.

1. $7\overline{)98}$ (117) $6\overline{)78}$ (111)

2. $9\overline{)765}$ (138) $8\overline{)946}$ (123)

3. $3\overline{)963}$ (115) $5\overline{)379}$ (119)

4. $4\overline{)\$5.04}$ (141)

5. Round to the nearest hundred. (150)

1732 89594 75

Copy and find the products.

6. 1654×3=⍰ (174)

7. $.59×9=⍰ (140)

8. $10.35×6=⍰ (175)

Write the number that belongs in place of the question mark. (147-149)

9. 1 ft. = ⍰ in. $\frac{1}{4}$ ft. = ⍰ in.

10. 1 yd. = ⍰ in. $\frac{1}{4}$ lb. = ⍰ oz.

11. $\frac{1}{2}$ yd. = ⍰ in. 3 lb. = ⍰ oz.

12. Which is larger $\frac{3}{4}$ or $\frac{6}{8}$? Draw a picture before you give your answer. (127)

13. Use numbers rounded to the nearest thousand and estimate the sum of 950+2165+5842. (151)

14. Show that if you know that \$25.60−\$12.50=\$13.10, you also know the sum of \$13.10 and \$12.50. (48)

15. Which figures will you cross out if you use the mark-out check to check Sue's sum? (161, 162)

SUE

$$\begin{array}{r}1426\\328\\2590\\+1642\\\hline 5986\end{array}$$

16. Write Sue's sum using words only. (167)

17. Copy. Find the sum. (165)

1463+645+27+154+4275

18. Write the number that each letter below stands for in writing Roman numbers. (171, 172)

I X L V

19. Write these numbers with words. (166)

45000 6000 102000 42000

20. Copy the numbers in problem 19 and put commas where they are necessary. (167)

21. Copy. Find the remainders. (169)

$$\begin{array}{r}834\\-479\\\hline\end{array}\qquad\begin{array}{r}4065\\-228\\\hline\end{array}\qquad\begin{array}{r}5726\\-2658\\\hline\end{array}\qquad\begin{array}{r}614\\-536\\\hline\end{array}$$

22. Copy. Find products. (174)

$$\begin{array}{r}2653\\\times 4\\\hline\end{array}\qquad\begin{array}{r}2538\\\times 2\\\hline\end{array}\qquad\begin{array}{r}1835\\\times 3\\\hline\end{array}$$

How Well Are You Doing?

Problems 1-5 each have an important fact missing. Read each problem carefully and then tell what the missing fact is.

1. Mrs. Smith gave the grocer a $10 bill. How much change should she receive?

2. Ann wrote 25 words in a spelling test. How many words did she get right?

3. Mr. Jones sold 500 bushels of wheat last week. How much did he get for the wheat?

4. Jack shared 124 marbles equally among his friends. How many marbles did each friend get?

5. The teacher divided 45 boys into equal teams. How many teams were there?

Find the answers to the following problems.

6. At $.45 a yard, what will Ruth pay for 8 yards of ribbon?

7. Alice is planning to seat 4 persons at each card table. How many card tables will she need to seat 64 persons?

8. Jack wants to make 4 equal packs from 2500 tickets. How many tickets should he put in each pack?

9. Jim sells greeting cards to make money. He gets $\frac{1}{4}$ of the amount of his sales. When he has sold $6.40 worth of cards, what are his earnings?

10. Jim sold 9 cards at 35¢ each. How much did he get for the cards?

11. Jim had 144 cards to sell. When he had 9 cards left, how many had he sold?

12. In the lunchroom, 12 children sit at each table. How many children are there at 9 tables?

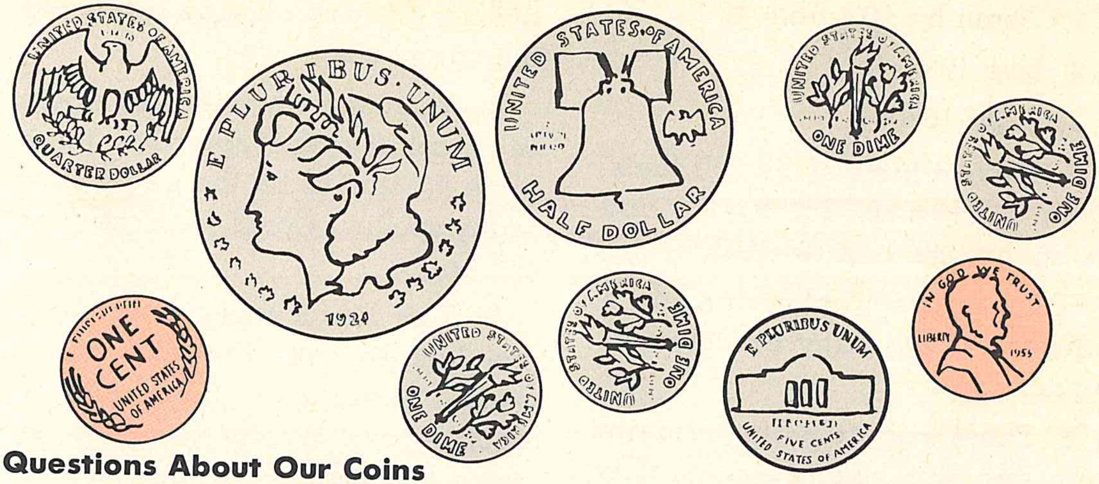
13. The Smith family are going on a 485-mile trip. After they have traveled 300 miles, how much farther must they go to complete their trip?

14. Joe spent $5.50 for a folding cot, $3.19 for a Keep Cool jug, and $2.29 for a camper's axe. How much did he pay for all of these things?

15. Jim has saved $25.75. He wants to buy a bicycle costing $64.95. How much more must he save to buy the bicycle?

16. Tom bought a bicycle that cost $49.95. He agreed to pay for it in 9 equal payments. What was the amount of each payment?

UNIT EIGHT



Questions About Our Coins

Gary was counting the money he had in his toy bank. The picture above shows his money spread on the table.

1. He said he had coins of six different values. Name these coins.

2. He said the name "half dollar" helped him to know how many such coins equal one dollar. What did he mean?

3. A dollar equals how many cents?

4. Write a division fact that will show how many nickels a quarter equals.

5. Count by 10's from 10 to 100. How does this counting help you to know how many dimes equal one dollar?

6. How many nickels equal one dollar? If you do not know, find out by subtracting.

You can write the value of a dime in three ways.

ten cents 10¢ $0.10

7. Write each of these amounts of money in three ways.

a dollar a half dollar
a quarter a nickel

8. If you had a quarter, a nickel, and a dime, how many cents would you have?

9. 7 dimes = ? cents

10. 4 dimes = ? cents

11. 9 dimes = ? cents

12. 5 dimes = ? cents

13. 3 dimes = ? cents

14. 6 dimes = ? cents

Multiplying Ten

1. Count by 10's from 10 to 100.

2. Five 10's = ☐.

3. Eight 10's = ☐.

4. Make a table of the 10's facts. Begin 1 × 10 = 10, 2 × 10 = 20, and go on through 10 × 10 = 100.

5. There are 10 gum drops in a package. How many are there in 6 packages?

6. There were 10 postage stamps in a row. Tom bought 8 rows. How many stamps did he buy?

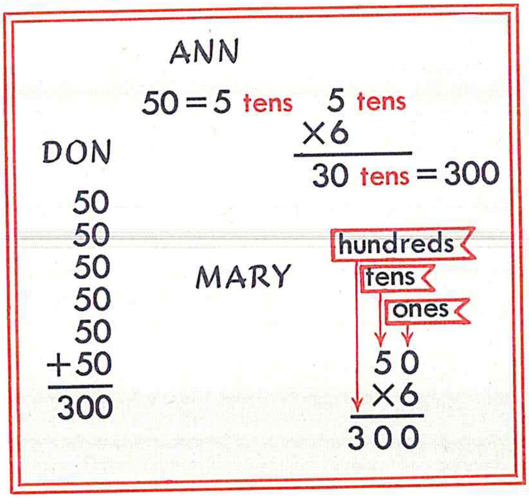
7. Tom bought a box of candy. He gave the clerk 5 dimes. If Tom did not get any change, what did the candy cost?

8. Ann counted 10 spelling words in a column and saw that there were 4 columns on the page. How many spelling words were there on the page?

9. Tom has 8 sacks of marbles. Joe has 9 sacks and Bill has 6 sacks. There are 10 marbles in each sack. Which boy has 90 marbles? Which boy has 80 marbles? Which boy has 60 marbles? Write a multiplication fact for each answer you gave.

Multiplying Two or More Tens

There are 50 gold stars in one package. Don, Ann, and Mary want to find out how many stars there will be in 6 packages.



1. Explain how each child found the answer.

2. Copy. Use Don's way to find the answer to the first three multiplication questions. Use Ann's way to find the answer to the last three.

60	40	90	60	80	90
×2	×3	×4	×7	×6	×8

3. Do all the multiplication examples again, using Mary's way.

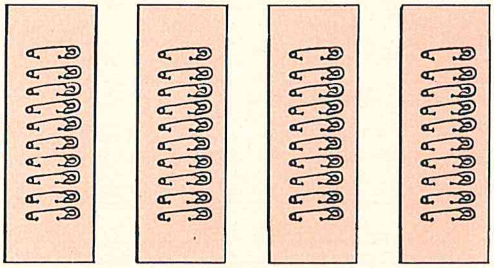
4. In which of the following examples will you think 6 × 4 tens as you multiply?

34	48	547	434
×6	×6	×6	×6

Multiplying by Ten

Ann's mother had 4 cards of safety pins. There were 10 safety pins on each card. Ann said there were 40 safety pins in all. She thought this way to find how many four tens equal.

A.

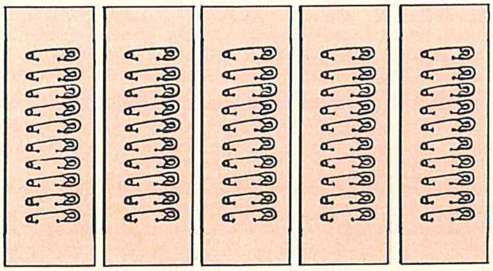


$$10 + 10 + 10 + 10 = 40$$

$$4 \times 10 = 40$$

1. Write an addition fact and a multiplication fact for picture B.

B.

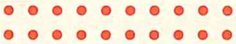


2. Ann said, "When I know $4 \times 10 = 40$, I also know the answer to $10 \times 4 = \square$." Look at Ann's number line. How does it show that she was right?

3. Draw a number line. On it show that three 10's = 30 and that ten 3's = 30.

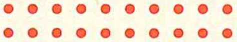
4. Copy these dot drawings. Use circles around dots to show the number fact for each drawing.

C.



Two 10's or $\begin{array}{r}10\\ \times 2\\ \hline 20\end{array}$

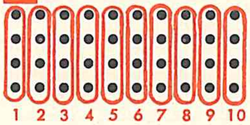
D.



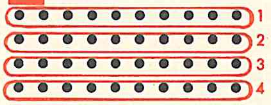
Ten 2's or $\begin{array}{r}2\\ \times 10\\ \hline 20\end{array}$

5. Write the multiplication question that drawing E answers. Write the multiplication question F answers.

E.

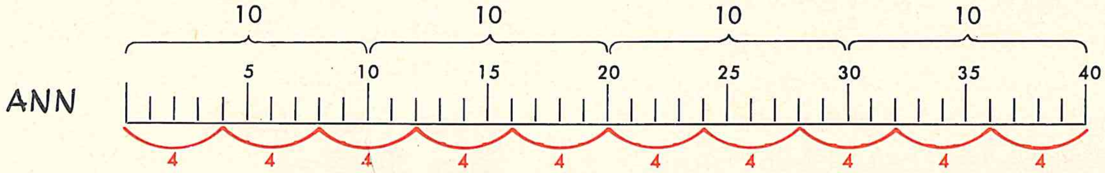


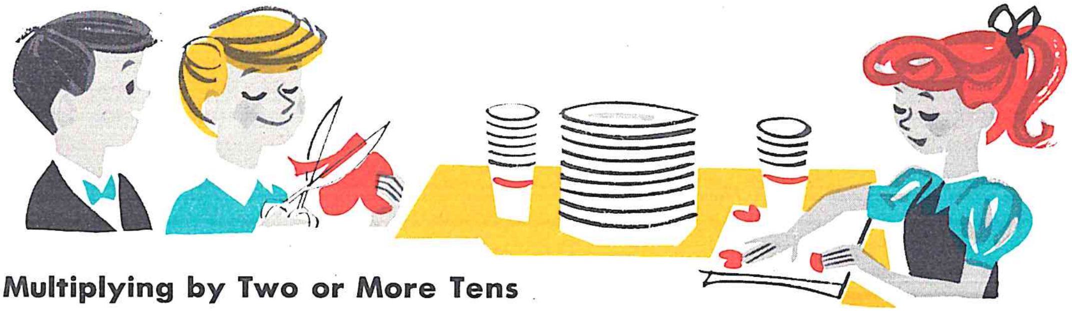
F.



6. Write the products.

$$\begin{array}{r}8\\ \times 10\\ \hline\end{array}\quad \begin{array}{r}5\\ \times 10\\ \hline\end{array}\quad \begin{array}{r}3\\ \times 10\\ \hline\end{array}\quad \begin{array}{r}9\\ \times 10\\ \hline\end{array}\quad \begin{array}{r}7\\ \times 10\\ \hline\end{array}\quad \begin{array}{r}6\\ \times 10\\ \hline\end{array}$$





Multiplying by Two or More Tens

Jim, Alice, and some other children were getting ready for a Valentine party. Alice was pasting 2 hearts on each paper napkin. She had 30 napkins.

Jim said, "I know that you will need 20 hearts for 10 napkins, but how many shall I cut out for 30 napkins?"

1. Alice did the work below. Can you explain how she found the answer?

$$\underbrace{\text{ten } 2\text{'s}} + \underbrace{\text{ten } 2\text{'s}} + \underbrace{\text{ten } 2\text{'s}} = \text{thirty } 2\text{'s}$$

$$\begin{array}{rrrr} 2 & 2 & 2 & \\ 2 & 2 & 2 & \\ 2 & 2 & 2 & \\ 2 & 2 & 2 & \\ 2 & 2 & 2 & \\ 2 & 2 & 2 & \text{ALICE} \\ 2 & 2 & 2 & \\ 2 & 2 & 2 & \\ 2 & 2 & 2 & \\ +2 & +2 & +2 & \\ \hline 20 & 20 & 20 & \end{array}$$

$$\text{Thirty } 2\text{'s} = 20 + 20 + 20 = 60$$

Bob said Alice used a long way. He said that he thought his way was better. Look at Bob's work.

$$\begin{array}{ll} 30 \times 2 = \square & \text{BOB} \\ 30 = 3 \text{ tens} & \\ 3 \text{ tens} \times 2 = 6 \text{ tens, or } 60 & \end{array}$$

2. Why is Bob's way better than Alice's?

3. Did Alice add or multiply to find her answer? Did Bob add or multiply to find his answer?

Jim said, "Bob's work helped me to think of a very easy way to answer the question 30 × 2 = □."

$$\begin{array}{lll} & & \text{JIM} \\ \text{THINK} & \text{WRITE} & \\ \begin{array}{r} 2 \\ \times 3 \text{ tens} \\ \hline 6 \text{ tens} = 60 \end{array} & \begin{array}{r} 2 \\ \times 30 \\ \hline 60 \end{array} & \text{or } 30 \times 2 = 60 \end{array}$$

4. The children are going to use 8 hearts to decorate each plate. They have 30 plates to decorate. How many hearts will they need for all the plates.

Think: 3 tens × 8 = □.
Then 30 × 8 = □.

5. Say or write the products.

2 tens × 4 = 80. Then 20 × 4 = ▢.
3 tens × 2 = ▢. Then 30 × 2 = ▢.
3 tens × 5 = ▢. Then 30 × 5 = ▢.
6 tens × 4 = ▢. Then 60 × 4 = ▢.

Write the products for the examples in rows 6-8. The work for the first example is given below.

THINK	MULTIPLY
60 = 6 tens 6 tens × 7 = 42 tens 42 tens = 420	$\begin{array}{r} 7 \\ \times 60 \\ \hline 420 \end{array}$

6.	$\begin{array}{r} 7 \\ \times 60 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 70 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 30 \\ \hline \end{array}$
7.	$\begin{array}{r} 8 \\ \times 80 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 30 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 30 \\ \hline \end{array}$
8.	$\begin{array}{r} 4 \\ \times 90 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 30 \\ \hline \end{array}$

9. There were 48 pencils in each box. Joe wanted to know how many pencils there were in 20 such boxes. To find out, he wrote these two multiplications.

	A.		B.	
JOE		$\begin{array}{r} 48 \\ \times 2 \\ \hline 96 \end{array}$		$\begin{array}{r} 48 \\ \times 20 \\ \hline 960 \end{array}$

Which multiplication gave Joe the correct answer?

10. In which multiplication did Joe multiply by 2 ones? By 2 tens?

11. When Joe multiplied by 2 ones, he thought, "2 × 8 = 16." He wrote the 6 in ones place. When he multiplied by 2 tens, he thought, "2 × 8 = 16." Why did he write the 6 in tens place? What figure did he write in ones place? Why?

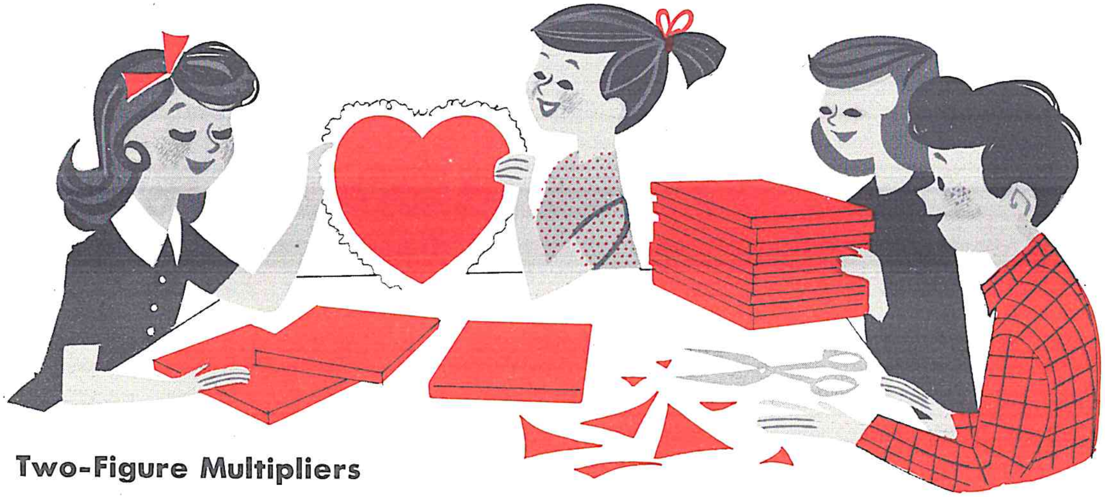
■ **Multiply by tens just as you multiply by ones. To show that the product means tens, write 0 in ones place.**

12. Explain how multiplication C helps in doing multiplication D. How does multiplication E help in doing multiplication F?

C. →	D.	E. →	F.
$\begin{array}{r} 37 \\ \times 2 \\ \hline 74 \end{array}$	$\begin{array}{r} 37 \\ \times 20 \\ \hline 740 \end{array}$	$\begin{array}{r} 65 \\ \times 9 \\ \hline 585 \end{array}$	$\begin{array}{r} 65 \\ \times 90 \\ \hline 5850 \end{array}$

▶ Copy. Find the products.

13.	$\begin{array}{r} 25 \\ \times 30 \\ \hline \end{array}$	$\begin{array}{r} 42 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 64 \\ \times 60 \\ \hline \end{array}$
14.	$\begin{array}{r} 84 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ \times 50 \\ \hline \end{array}$	$\begin{array}{r} 45 \\ \times 70 \\ \hline \end{array}$	$\begin{array}{r} 99 \\ \times 40 \\ \hline \end{array}$
15.	$\begin{array}{r} 25 \\ \times 60 \\ \hline \end{array}$	$\begin{array}{r} 81 \\ \times 90 \\ \hline \end{array}$	$\begin{array}{r} 68 \\ \times 70 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ \times 80 \\ \hline \end{array}$



Two-Figure Multipliers

The fourth-grade class was using paper doilies to make valentines. There were 18 doilies in a package. Ruth brought 3 packages. Joan brought 10 packages. The class wanted to find out how many doilies there were in the 13 packages.

Everyone in the class agreed that $13 \times 18 = \boxed{?}$ was the number question that had to be answered. No one in the class knew how to multiply by a two-figure number like 13.

$$\begin{array}{r} 18 \\ \times 13 \\ \hline \boxed{?} \end{array}$$

1. Ruth said, "I brought 3 packages. I can find how many doilies in my 3 packages." How many were there?

2. Joan knew how to find how many doilies there were in her 10 packages. How many were there?

3. After Ruth and Joan found how many doilies each brought, how could the class find out how many doilies there were in the 13 packages?

4. Instead of using 13 as the multiplier, what two multipliers did the children use?

$$\text{RUTH} \quad \begin{array}{r} 18 \\ \times 3 \\ \hline 54 \end{array} \qquad \text{JOAN} \quad \begin{array}{r} 18 \\ \times 10 \\ \hline 180 \end{array} \qquad \begin{array}{rl} 54 & \text{Ruth brought} \\ +180 & \text{Joan brought} \\ \hline 234 & \text{in 13 packages} \end{array}$$

The class had 24 packages of paper hearts. There were 16 hearts in each package. The class did not know how to multiply by two-figure numbers like 24. How could they find how much 24 × 16 equals?

5. Jack said, "I can find part of the product. I see 4 ones in 24. I can multiply 16 by the 4 ones." What was the first part-product, or first partial product, that Jack found?

JACK **Step One**

24 = 2 tens and 4 ones

4 ones × 16 = $\boxed{?}$

$$\begin{array}{r} 16 \\ \times 4 \\ \hline 64 \end{array}$$ first part-product

6. Joe found the second part-product, or the second partial product. Why did he multiply by 20?

JOE **Step Two**

2 tens × 16 = $\boxed{?}$

$$\begin{array}{r} 16 \\ \times 20 \\ \hline 320 \end{array}$$ second part-product

7. How did Jerry find the whole product, or the product of 24 × 16?

JERRY **Step Three**

$$\begin{array}{r} 64 \\ +320 \\ \hline 384 \end{array}$$

64 first partial product

+320 second partial product

384 product

Find the answers to examples 8 through 13. Use the three steps that Jack, Joe, and Jerry used.

Step One: Multiply by the ones.

Step Two: Multiply by the tens.

Step Three: Add your two partial products.

8. 53 (3 ones and 5 tens) × 12 = $\boxed{?}$

9. 32 (2 ones and 3 tens) × 25 = $\boxed{?}$

10. 26 × 15 = $\boxed{?}$ 32 × 26 = $\boxed{?}$

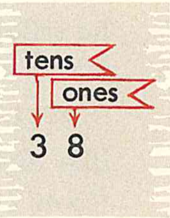
11. 43 × 24 = $\boxed{?}$ 25 × 18 = $\boxed{?}$

12. 23 × 28 = $\boxed{?}$ 34 × 22 = $\boxed{?}$

13. 34 × 21 = $\boxed{?}$ 24 × 23 = $\boxed{?}$

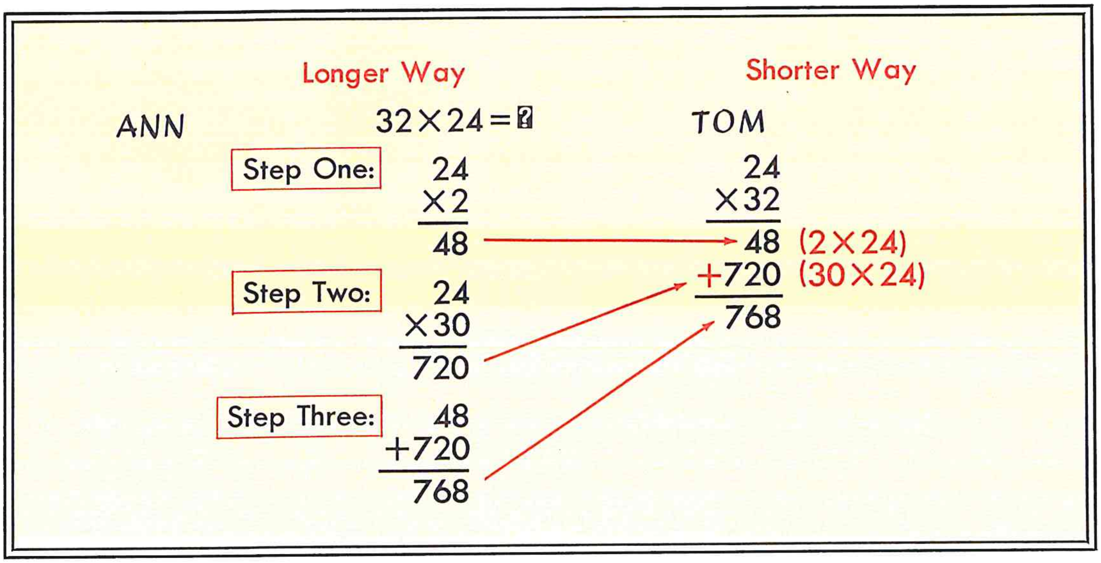
14. Try to make up a rule for multiplying by a two-figure number.

15. Two-figure numbers are often called two-place numbers. Name the places in the number at the right.



16. Write a two-place number having zero in ones place.

17. Write a two-place number that means 7 tens and 5 ones.



A Shorter Way to Multiply by Two-Figure Multipliers

The class made up this rule for multiplying by a two-figure, or two-place, multiplier.

■ **To multiply by a two-place number, multiply by the ones first. Next multiply by the tens. Then add the two partial products.**

1. Does Ann's work show that she did what the rule tells her?

Tom studied Ann's work. Then he said, "I can follow the rule and use a shorter way than Ann did."

2. How is Tom's multiplication like Ann's? How is his work different from Ann's?

3. What makes Tom's multiplication shorter than Ann's?

4. Copy. Fill in the missing partial products. Then find the products.

A. 26 ×43 ☐☐ +1040	**B.** 35 ×26 ☐☐☐ +700	**C.** 46 ×64 184 +☐☐☐☐
D. 32 ×73 96 +☐☐☐☐	**E.** 29 ×68 ☐☐☐ +1740	**F.** 58 ×96 ☐☐☐ +☐☐☐☐

▶ Copy. Find the products.

5. 28 ×46   14 ×53   86 ×35   49 ×65

Multiplication Practice and Problems

▶ Copy. Find the products.

1.	63 ×21	47 ×43	52 ×26	89 ×31
2.	81 ×22	43 ×61	69 ×54	75 ×48
3.	63 ×18	17 ×42	75 ×47	29 ×32
4.	38 ×31	58 ×14	46 ×11	83 ×53
5.	43 ×24	75 ×13	26 ×60	80 ×15
6.	47 ×39	55 ×28	38 ×35	68 ×27
7.	73 ×82	47 ×61	92 ×54	81 ×76
8.	79 ×57	33 ×98	45 ×75	86 ×87

9. Mr. West bought 28 pieces of lumber. Each piece was 72 inches long. What was the total length of the lumber in inches?

10. A carpenter nailed 54 shingles in a row. How many shingles did he need to make 36 rows?

11. A man bought 12 bags of smokeless coal. Each bag weighed about 18 pounds. How many pounds of coal did he buy?

12. A farmer feeds one pig 12 ears of corn. How many ears will he need for 35 pigs?

13. A farmer's wife shells 30 ears of corn each day for her chickens. How many ears should she shell if she wants enough corn to feed the chickens 28 days?

14. At $.95 a bag, how much will a farmer get for 48 bags of potatoes?

15. Sue paid $.59 a yard for some lace. How much will 25 yards of this lace cost?

16. One subscription to a science magazine for children costs $.35 a year. How much will it cost to get subscriptions for 32 children for one year?

17. Bob gets $.35 for each magazine that he delivers. How much money should he have after delivering 25 of these magazines?

18. At 36¢ a dozen, what will 24 dozen tomato plants cost?

Give Answers Only

1. How many ones are there in 36? How many ones are there in ones place? How many tens are there in tens place?

2. How many tens are there in 450?

3. What does the zero in 450 show? What does the 45 in 450 mean?

4. The zero in 5204 shows there are no tens in tens place in this number. What does the zero in 1065 show? In 608? In 50?

5. The zero in numbers like 1065, 608, and 50 is called a place-holder. What place does the zero hold in 1065? In 608? In 50?

6. The number 1065 means one thousand sixty-five. What would happen to the meaning of 1065 if you did not put a place-holder in hundreds place?

7. What is the largest number that you can write with the figures 1, 7, 0, and 4?

8. What is the smallest number that you can write with the figures 1, 7, 0, and 4?

9. Which number is larger: 1001 or 1010?

10. In which places are place-holders used in 1001? In 1010?

Mixed Practice

Copy. Find the answers.

1. $$\begin{array}{rrrr} & 67 & 735 & 48 \\ 70 & 8 & 37 & 301 \\ 45 & 35 & 18 & 54 \\ 9 & 99 & 562 & 700 \\ +38 & +7 & +6 & +38 \\ \hline \end{array}$$

2. $$\begin{array}{rrrr} 427 & 953 & 735 & 637 \\ -252 & -428 & -388 & -542 \\ \hline \end{array}$$

3. $$\begin{array}{rrrr} 25 & 92 & 72 & 53 \\ \times 37 & \times 46 & \times 28 & \times 19 \\ \hline \end{array}$$

4. $9\overline{)3600}$ $8\overline{)1376}$ $7\overline{)1834}$

5. $8\overline{)781}$ $6\overline{)309}$ $7\overline{)417}$

6. $6\overline{)519}$ $8\overline{)633}$ $9\overline{)838}$

7. $8\overline{)739}$ $6\overline{)347}$ $9\overline{)638}$

8. $9\overline{)532}$ $6\overline{)462}$ $8\overline{)547}$

9. $5\overline{)260}$ $4\overline{)364}$ $6\overline{)438}$

Shortening the Second Partial Product

Joan and Bill's class worked this problem:

A bushel of shelled corn weighs 56 pounds. How many pounds will 24 bushels of shelled corn weigh?

1. Go over Joan's multiplication. Is her work correct?

JOAN

$$\begin{array}{r} 56 \\ \times 24 \\ \hline 224 \\ +1120 \\ \hline 1344 \end{array}$$

BILL

$$\begin{array}{r} 56 \\ \times 24 \\ \hline 224 \\ +112 \\ \hline 1344 \end{array}$$

Bill said, "I forgot to write the zero in ones place in my second partial product. How could I get the same answer as Joan did?"

2. Study Bill's multiplication. Can you tell why he got the same answer as Joan?

3. Bill wrote the right-hand figure of his second partial product in tens place. Did he need the zero place-holder that Joan used?

4. Look at Jim's work. He has worked this example: $73 \times 64 = \square$. How did he show that the 8 in his second partial product means 8 tens? That the 2 in his first partial product means 2 ones?

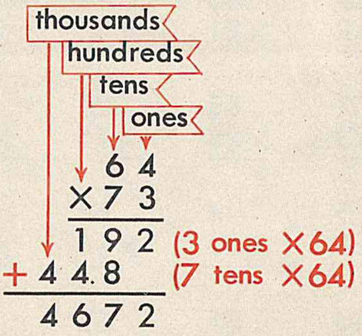
After studying Jim's multiplication, the class made these rules for placing the right-hand figures of each partial product.

- **When you multiply by the ones figure, place the right-hand figure of that partial product in ones place.**

- **When you multiply by the tens figure, place the right-hand figure of that partial product in tens place. You do not need to write zero in ones place.**

JIM

$$\begin{array}{rl} 64 & \\ \times 73 & \\ \hline 192 & \text{first partial product} \\ +448 & \text{second partial product} \\ \hline 4672 & \end{array}$$



Using the Shorter Way to Multiply

Study Joe's work. Think of the rules you learned on page 195.

Shorter Way

JOE

$$\begin{array}{r} 72 \\ \times 34 \\ \hline 288 \\ +216 \\ \hline 2448 \end{array}$$

Leave space empty. Think 0.

1. When Joe thought, "4×2=8," how did he know where to place the 8?

2. When Joe thought, "3×2=6," why did he write the 6 in tens place?

▶ Copy. Use the shorter way to find the products. Check by going over your work.

3. $\begin{array}{r} 21 \\ \times 32 \\ \hline \end{array}$ $\begin{array}{r} 43 \\ \times 23 \\ \hline \end{array}$ $\begin{array}{r} 21 \\ \times 14 \\ \hline \end{array}$ $\begin{array}{r} 32 \\ \times 12 \\ \hline \end{array}$

4. $\begin{array}{r} 28 \\ \times 12 \\ \hline \end{array}$ $\begin{array}{r} 33 \\ \times 21 \\ \hline \end{array}$ $\begin{array}{r} 48 \\ \times 32 \\ \hline \end{array}$ $\begin{array}{r} 69 \\ \times 13 \\ \hline \end{array}$

5. $\begin{array}{r} 72 \\ \times 33 \\ \hline \end{array}$ $\begin{array}{r} 65 \\ \times 24 \\ \hline \end{array}$ $\begin{array}{r} 28 \\ \times 74 \\ \hline \end{array}$ $\begin{array}{r} 93 \\ \times 28 \\ \hline \end{array}$

6. $\begin{array}{r} 15 \\ \times 21 \\ \hline \end{array}$ $\begin{array}{r} 44 \\ \times 22 \\ \hline \end{array}$ $\begin{array}{r} 59 \\ \times 46 \\ \hline \end{array}$ $\begin{array}{r} 56 \\ \times 48 \\ \hline \end{array}$

7. $\begin{array}{r} 46 \\ \times 31 \\ \hline \end{array}$ $\begin{array}{r} 91 \\ \times 52 \\ \hline \end{array}$ $\begin{array}{r} 38 \\ \times 67 \\ \hline \end{array}$ $\begin{array}{r} 79 \\ \times 37 \\ \hline \end{array}$

8. $\begin{array}{r} 64 \\ \times 41 \\ \hline \end{array}$ $\begin{array}{r} 37 \\ \times 26 \\ \hline \end{array}$ $\begin{array}{r} 29 \\ \times 83 \\ \hline \end{array}$ $\begin{array}{r} 86 \\ \times 49 \\ \hline \end{array}$

9. There are 16 ounces in one pound. How many ounces of ground pepper will there be in a sack marked "Pepper — 15 pounds"?

10. There are 36 inches in one yard. How many inches of ribbon are there in a piece of ribbon that is 12 yards long?

11. Mary's sister typewrites 32 lines on each page. How many lines has she written after she finishes typing 25 pages?

12. There are 12 eggs in one dozen. How many eggs did the farmer sell if he sold 45 dozen eggs?

13. It takes 24 pieces of paper to make one science notebook. How many pieces of paper will it take to make 34 science notebooks?

14. There are 24 seats in a row in the school auditorium. How many children can be seated in 18 rows?

15. Tom sells greeting cards. He had 15 boxes of cards, with 36 cards in each box. How many cards were there in the 15 boxes?

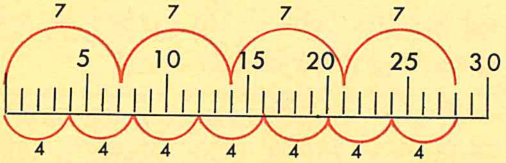
16. The label says there are 48 cookies in a package. How many cookies will there be in 12 of these packages?

Checking Your Longer Multiplications

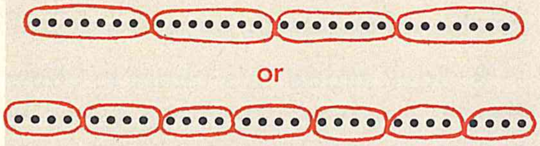
The teacher said, "In easy multiplication examples like 4 × 7 = 28, you can check your answer in several ways. Show me some of these ways."

1. Explain the way that each child used.

GARY



RUTH



DON

$$\begin{array}{rr} & 4 \\ & 4 \\ & 4 \\ 7 & 4 \\ 7 & 4 \\ 7 & 4 \\ +7 & +4 \\ \hline 28 & 28 \end{array}$$

MARY

$$\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array} \qquad \begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$$

2. If you were answering the multiplication question: 24 × 46 = ▢, which of the checks that the children used would take too long?

3. Jane found the answer to 24 × 46 = ▢. Look at her work below. How did she check her multiplication?

How is her check like Mary's? How could Mary and Jane tell that their product was correct?

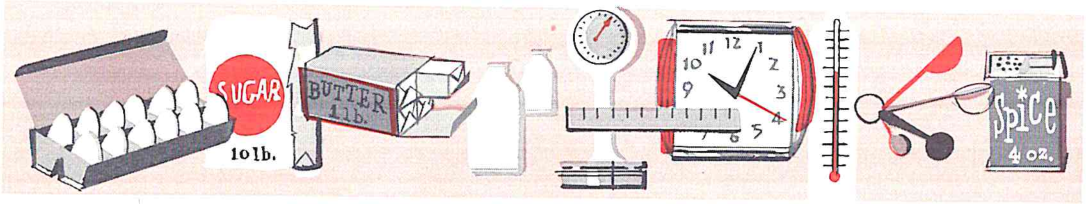
JANE

MULTIPLICATION — CHECK

$$\begin{array}{r} 46 \\ \times 24 \\ \hline 184 \\ 92 \\ \hline 1104 \end{array} \xleftarrow{\quad} \text{same} \xrightarrow{\quad} \begin{array}{r} 24 \\ \times 46 \\ \hline 144 \\ 96 \\ \hline 1104 \end{array}$$

▶ Copy. Multiply. Use Jane's check.

4.	69 × 42	24 × 82	93 × 64	84 × 23
5.	25 × 39	65 × 86	56 × 97	39 × 64
6.	86 × 48	83 × 78	76 × 88	43 × 32
7.	85 × 35	77 × 22	87 × 26	84 × 29
8.	38 × 64	45 × 82	19 × 48	83 × 36


SUGAR
10 lb.
BUTTER
1 lb.
SPICE
4 oz.

Liquid Measures

The things shown in the picture above will remind you of different ways we measure.

1. Make a list of ten words we use when we speak of different kinds of measure.

Write "w" after any that name measures of weight. Write "n" after any that name measures of number. Write "t" after any that name measures of time.

2. Which of the words you wrote are used to name liquid measures?

3. Name several things that we might call liquids.

4. Name some things that are often bought by the quart.

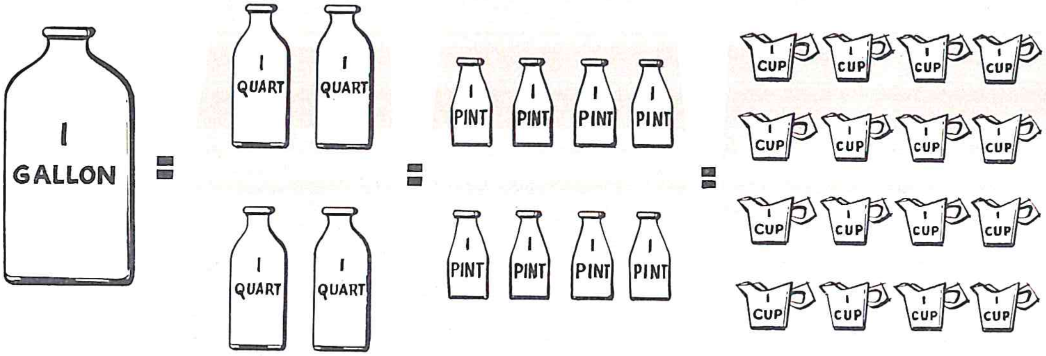
5. Name some things that can be bought by the pint.

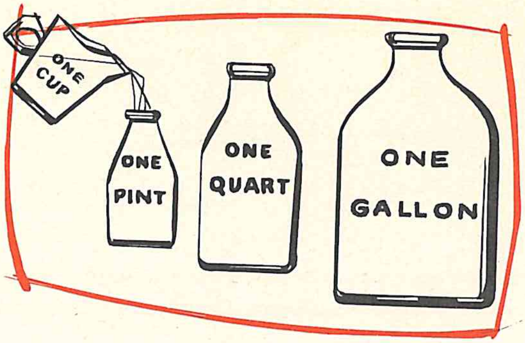
6. Name some liquid measures that are used at a filling station.

7. Mr. Albert bought 6 qt. of oil for his car. Is this more or less than a gallon of oil?

8. Mr. Smith wanted to buy a gallon of paint. The clerk at the store said he had only quarts in the color Mr. Smith wanted. How many quart cans will he give Mr. Smith, if Mr. Smith buys the paint?

9. Jack made this chart to show liquid measure. Read the table of liquid measure on the next page and see if this chart is correct.





LIQUID MEASURES

2 cups (c.) = 1 pint (pt.)
2 pints (pt.) = 1 quart (qt.)
4 quarts (qt.) = 1 gallon (gal.)

10. If you pour a gallon of milk into quart bottles, how many bottles will you fill?

11. If you pour a quart of tomato juice into glasses holding 1 cup, how many glasses will you fill?

12. Bob drinks a pint of milk a day. In how many days will he drink a gallon of milk?

13. Father bought 2 gallons of paint. How many quarts did he buy?

14. What is the name of one-fourth gallon? Of one-half quart?

15. The picture above shows a cup of water being poured into a pint bottle. How full will the pint bottle be after all the water is poured into it?

16. Mrs. Jones ordered $\frac{1}{2}$ gallon of milk. The milkman had no half gallons. What can he leave instead of a $\frac{1}{2}$-gallon bottle?

17. Ann made a half gallon of lemonade. How many cupfuls is this?

18. A grocer bought 32 quarts of milk. How many gallons did he buy?

19. 6 gal. = $\boxed{?}$ qt.

20. 12 qt. = $\boxed{?}$ pt.

21. 24 pt. = $\boxed{?}$ qt.

22. 16 c. = $\boxed{?}$ pt.

23. $\frac{1}{2}$ gal. = $\boxed{?}$ pt.

24. $\frac{1}{4}$ gal. = $\boxed{?}$ pt.

Answer yes or no to each of these questions.

25. Is a pint one half of a quart?

26. Is a gallon 4 times a quart?

27. Are there 8 pints in a gallon?

28. Is a quart equal to 2 cups?

29. Will two half pints of water exactly fill 2 cups?

30. Jim took a half-gallon jug of water on a trip. He said he had enough water to fill 8 cups. Was he right?

31. Joan had a gallon jug of orangeade. She filled two pint bottles from the jug. Did she have 6 pints left in the jug?

DRY MEASURES

2 pints (pt.) = 1 quart (qt.)
8 quarts (qt.) = 1 peck (pk.)
4 pecks (pk.) = 1 bushel (bu.)

Dry Measures

Gary saw the sign, "35¢ qt.," on some boxes of berries. He said, "That sign says qt. Does it mean quart? I thought you used a quart to measure liquids."

Gary's sister explained that "quart" and "pint" are usually liquid measures, but they are often dry measures, too. She said things like fruits, vegetables, and grains are measured by dry measure, especially in the country.

1. If you live in the city, do you usually buy green beans by the quart or by the pound?

2. Do you buy potatoes by the peck or by the pound?

3. Gary's sister bought $\frac{1}{2}$ bu. of green beans. How many pecks did she buy?

4. The farmer told Dave to feed the horses a peck of oats. Dave couldn't find a peck measure, but he did find a quart measure in the feed bin. How can he measure a peck of oats for the horses?

5. David picked a quart of berries and a pint of berries. How many pints of berries did he pick?

1 quart

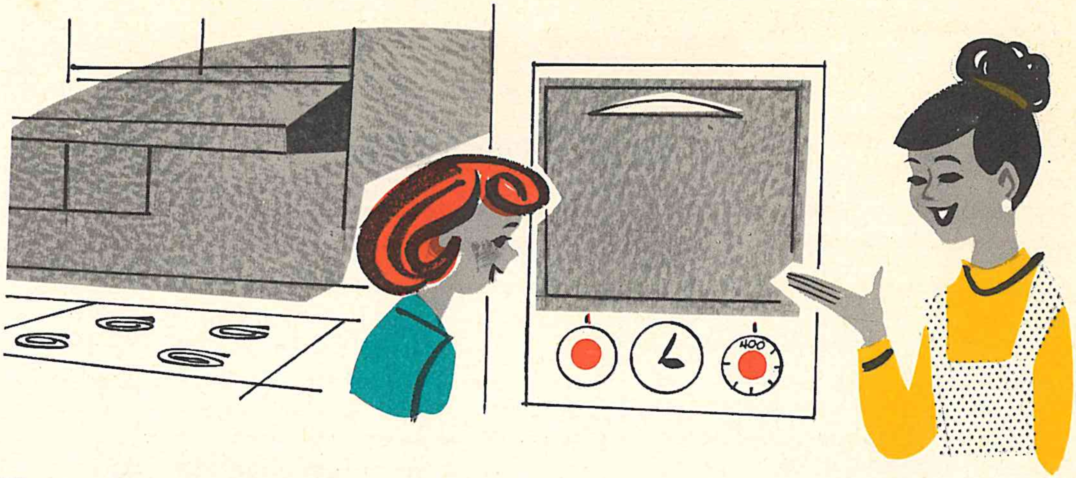
1 pint

6. Mrs. Smith sold 24 pint boxes of shelled peas. How many quarts did she sell?

7. How many quarts of dry beans will it take to fill a bushel basket?

8. How many pints of strawberries will you use if a recipe calls for 4 quarts of berries?

9. 8 pk. = ▯ qt. 16 bu. = ▯ pk.
10. 9 qt. = ▯ pt. 4 bu. = ▯ qt.
11. 48 qt. = ▯ pk. 64 pt. = ▯ qt.



Measuring Temperature

Ruth is going to bake some biscuits. Her mother told her to set the oven temperature at 475°. The sign   means degrees.

1. Does Ruth have the temperature set right for baking the biscuits? (See the picture above.)

2. Will a 475° oven be hotter or cooler than the one shown above?

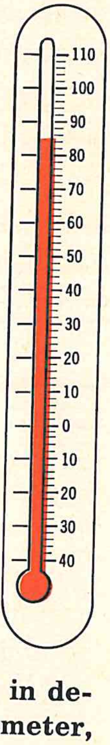
3. When Ruth's biscuits are done, will it be safe to try to take the pan from the oven with bare hands? Why?

Water boils at 212°. The oven Ruth used was 475°. These temperatures are very high.

4. How can you find out what the temperature of your classroom is?

5. Does the temperature on a summer day ever go above 100°?

6. Water freezes at about 32° above zero. Could you go skating if the temperature was 10° below zero?



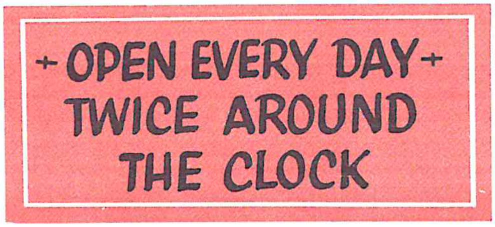
7. Do you think you could go swimming at the temperature shown on the thermometer pictured at the right?

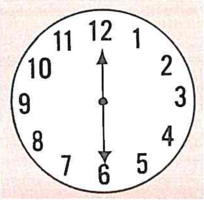
8. Draw a thermometer. Show 20° below zero.

9. Look at the thermometer in your classroom. What is the highest temperature it can measure? The lowest?

■ **Temperature is measured in degrees. In reading a thermometer, say, "Below zero" if the number you are reading is below the zero on the thermometer.**

Measures of Time





"This sandwich shop never closes," said Bill.

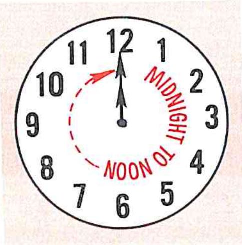
"How do you know it never closes?" asked Dave.

1. Read the sign in the window. Can you tell how Bill found out that the shop stayed open night and day?

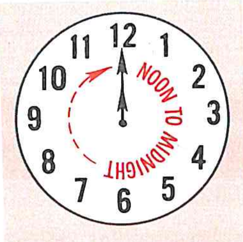
2. How many hours are there on a clock face?

3. How many hours are there in 1 day?

4. How many times does the hour hand go around the clock face in 1 day?



A.M. is from midnight to noon.



P.M. is from noon to midnight.

Twelve o'clock at night is called midnight. Twelve o'clock in the day is called noon.

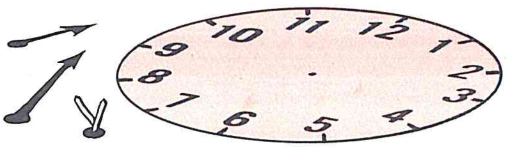
5. The train Joe was waiting for arrived at 2 A.M. Why was he sleepy?

6. At what time do you usually get to school in the morning?

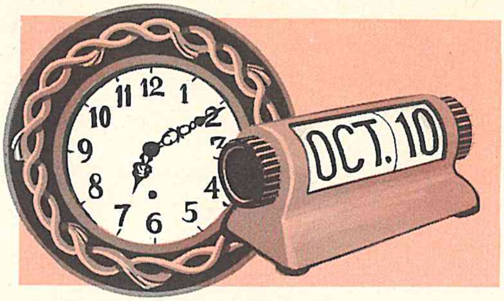
7. When does school close for the day?

8. Dave looked at the clock in the sandwich shop window. He said, "We will be late if we don't start for school." Was it 12:30 A.M. or 12:30 P.M.?

9. Sue made a clock face. She marked the face into 12 equal parts. She numbered these parts to show the hours. Look at the picture below.



Sue then marked off the spaces for minutes. How many spaces did she make between 12 and 1? Between 1 and 2?



10. Count the minutes around the clock face by 5's. How many minutes will it take the minute hand to go once around the clock?

11. At the exact hour, the minute hand is at 12. Where will the minute hand be at a quarter after the hour?

Think: $\frac{1}{4}$ of 60 = ⍰.

12. Where will the minute hand be at half past the hour?

Think: $\frac{1}{2}$ of 60 = ⍰.

Which clock face at the bottom of the page shows —

13. Half past eight
14. A quarter past two
15. A quarter to seven
16. Six minutes of one
17. 9:05
18. 6:45
19. 2:15
20. 8:30

MEASURES OF TIME

60 seconds (sec.) = 1 minute (min.)
60 minutes (min.) = 1 hour (hr.)
24 hours (hr.) = 1 day (da.)
7 days (da.) = 1 week (wk.)

21. An engineer on a fast train said the train often travels a mile in 45 seconds. Is this time more or less than a minute?

Find the answers.

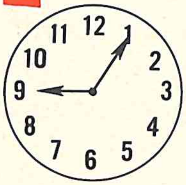
22. 3 da. = ⍰ hr. 6 wk. = ⍰ da.
23. 2 min. = ⍰ sec. 1 da. = ⍰ min.
24. $\frac{1}{2}$ min. = ⍰ sec. $\frac{1}{4}$ da. = ⍰ hr.

25. Ann began reading at 10:15. She read 1 hr. and 15 min. At what time did she stop reading?

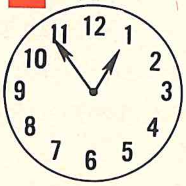
26. Bob left home at 8:30 A.M. He returned at 11:30 A.M. How many hours was he gone?

27. Tom expected to meet a train at 2:45 P.M. The train did not arrive until 3:15 P.M. The train was how many minutes late?

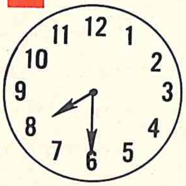
A.



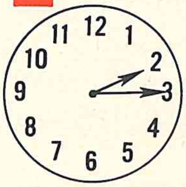
B.



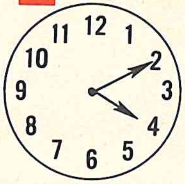
C.



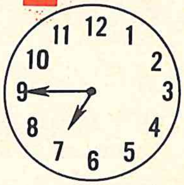
D.



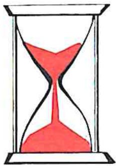
E.



F.



Measuring Improvement—Test 8



Here is another test that will help you measure your improvement. Work carefully and steadily. Try to make this the best of all your improvement test scores.

Begin and stop when the teacher gives the signal.

▶ Write the sums on folded paper.

1.	8	26	43	
	6	16	8	768
	0	10	25	433
	7	18	39	404
	+9	+43	+8	+560

▶ Write the differences on folded paper.

2.	56	74	81	348
	−7	−65	−27	−264

▶ Copy. Find the products.

3.	28	63	87	45
	×9	×38	×45	×79
4.	325	27	39	68
	×6	×48	×63	×57

▶ Copy. Find the quotients.

5. $6\overline{)468}$ $7\overline{)1344}$ $9\overline{)7875}$

6. $8\overline{)7656}$ $6\overline{)4734}$ $8\overline{)3512}$

Copy ready to work. Find the answers.

7. \$15.69 + \$6.72 + \$4.06 + \$15.60

8. \$.67 + \$1.56 + \$.08 + \$.39

9. \$5.43 − \$.95

10. \$41.10 from \$75.00

▶ Copy. Find the products.

11. 46 times 87 57 × 98

▶ Copy. Divide. Write left-over part as a remainder.

12. $7\overline{)3027}$ $8\overline{)4738}$ $9\overline{)6142}$

13. 4738 divided by 9

Special Helps

1. Try to find exactly what your mistake is in any example you answered incorrectly. Using a check may help you to find your error.

2. Use the index of this book. Look under "addition," "subtraction," "multiplication," and "division" to find pages to help in these processes.

Answers Only

Do not use your pencil to find the answer. Think and then write the answer only.

1. Ann poured a gallon of cider into quart bottles. How many bottles did she fill?

2. It took exactly one half day to travel from Joe's house to camp. How many hours did it take?

3. There are 3 dozen paper plates in a package. Sue bought one package. How many plates did she buy?

4. Jane said, "I will be there in half a minute." How many seconds did she mean?

5. Jack counted 25 seats in a row. How many seats were there in 10 of these rows?

6. Jane was buying ice cream for a party. She wanted $\frac{1}{2}$ gallon, but there were only pint packages in the display case. How many pint packages should she take?

7. Mr. Jones needed 2 gallons of paint. He found out that the color he wanted came only in quart cans. How many quart cans must he buy to have enough paint?

8. How many peck baskets can a farmer fill from a bushel of peaches?

9. The temperature at noon was 75°. At 6 P.M. the thermometer read 60°. How much had the temperature dropped?

10. Alice practiced her piano lesson from 5 P.M. to 5:30 P.M. What part of an hour did she practice?

11. Jerry left for school at 12:45 P.M. He has to be at school by 1 P.M. How many minutes does he have in which to get to school?

Using Your Index

Use the index of this book. Find the answers to these questions.

1. On which pages will you look to review liquid measures? Measures of counting? Time measures? Measures of length? Temperature?

2. What pages can you use if you need help in subtracting money numbers? In adding money numbers?

3. On what pages will you find help in reviewing the basic facts in addition? In subtraction? In multiplication? In division?

4. What pages will help you with column addition?

5. On which pages will you look to review measures of weight?

How Well Have You Learned?

1. What rule helps you to give at a glance the answers to these mutliplication questions?

$$\begin{array}{rrrr} 58 & 34 & 20 & 15 \\ \times 10 & \times 10 & \times 10 & \times 10 \\ \hline \end{array}$$

2. To answer the multiplication question 30×15=☐, you think 3 tens×15=45 tens. Write 45 tens using figures only.

3. How many tens are there in your multiplier when the multiplier is 65? How many ones are there?

4. Write the first partial product for 32×24.

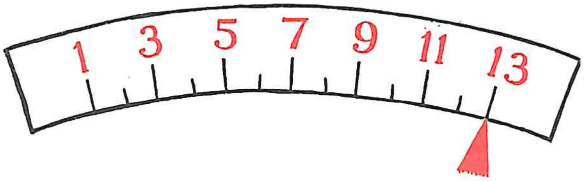
GARY

$$\begin{array}{r} 47 \\ \times 54 \\ \hline 188 \\ 235 \\ \hline \end{array}$$

5. When Gary found his second partial product, his multiplication was 5 tens ×47=235 tens. When he wrote his second partial product, how did he show that 235 meant 235 tens?

6. Jim says he checks his product by exchanging the places of the multiplier and the multiplicand and multiplying again. Show what Jim means by finding and checking the product for the example 48×95=☐.

7. Use a number line to show that the product of 3×5 is the same as the product of 5×3.



8. Draw a place-value frame like the one shown below. On your place-value frame write Sue's second partial product. Then write her first partial product on your place-value frame.

SUE

$$\begin{array}{r} 53 \\ \times 27 \\ \hline 371 \\ 106 \\ \hline 1431 \end{array}$$

thousands	hundreds	tens	ones

9. What is another way to give the time when it is nine forty-five? Ten-thirty? Fifteen minutes after one?

10. Write an example with 36 as the multiplier.

11. Write the names of two dry measures that a farmer might use.

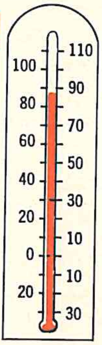
12. Name four measures that might be used to measure liquids.

13. Do you go to lunch at 12 A.M. or 12 P.M.?

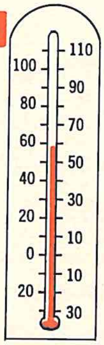
Helping Yourself

1. What is the temperature shown on each of these thermometers? (201)

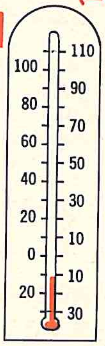
A.



B.

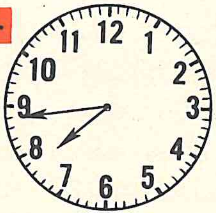


C.

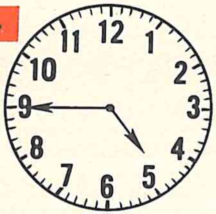


2. What is the time shown on each of these clock faces? (202, 203)

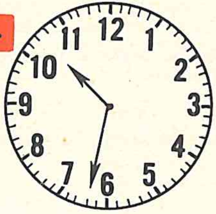
D.



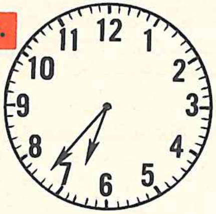
E.



F.



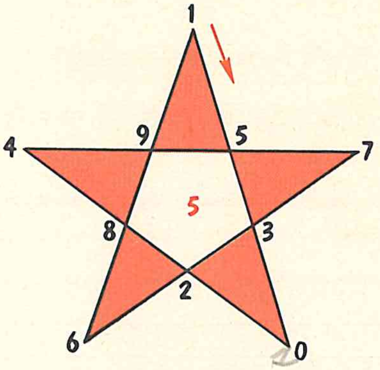
G.



3. Here is practice that will help you if you make mistakes when you multiply and carry.

Draw and number a star like the one shown in the next column.

Begin with any outside number that you wish. Multiply it by the number in the star. Add 3 to each product you get. Keep doing this until you get around the star.



4. Keep changing the number inside the star until you have used all the numbers from 0 through 9. Keep changing the number to be added to the products, using any number from 2 through 9.

5. If you cannot understand the check shown here, study page 197.

MULTIPLICATION			CHECK
multiplicand	76	→	34
multiplier	×34	→	×76
	304		204
	228		238
product	2584	← same →	2584

Copy. Find the products. Check.

6.	59 ×68	83 ×28	34 ×48	73 ×23
7.	24 ×82	93 ×64	84 ×23	38 ×64

How Well Are You Doing?

1. A gardener has 45 evergreen shrubs planted in each row. How many shrubs has he if there are 75 rows?

2. There are 72 sheets of colored paper in one package. How many sheets will there be in 12 of these packages?

3. A class wants to make 25 notebooks. Each notebook will take 15 sheets of paper. How many sheets will it take to make all of the notebooks?

4. Jerry had a rope that measured 48 ft. in length. He gave $\frac{1}{4}$ of the rope to Bill. How long was Bill's piece of the rope?

5. The milkman delivered 64 pints of milk at a lunch stand. How many gallons of milk did the 64 pints equal?

6. Yesterday at 11 A.M. the temperature was 56°. Today at the same hour the temperature was 65°. Is today cooler or warmer than yesterday?

7. $\frac{1}{4}$ of a pound = ⍰ oz.

8. $\frac{1}{2}$ of a yard = ⍰ in.

9. $\frac{1}{2}$ of an hour = ⍰ min.

10. $\frac{1}{4}$ of a dollar = ⍰ cents.

11. Bill divided 36 paper clips equally among 9 boys. How many clips did each boy get?

12. Jack got $10.00 for his birthday. He could not decide whether to buy a $9.75 baseball suit or a $3.95 bat. How much will he have left if he decides to buy the cheaper of the two things?

13. At the store, Ann got $1.75 worth of meat, a sack of sugar costing 98¢, a 45-cent can of pineapple slices, and a bunch of radishes costing $.08. How much did she pay for all of these things?

Copy. Find the products. Check.

14.	$\begin{array}{r} 35 \\ \times 41 \\ \hline \end{array}$	$\begin{array}{r} 36 \\ \times 23 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ \times 57 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ \times 58 \\ \hline \end{array}$
15.	$\begin{array}{r} 82 \\ \times 63 \\ \hline \end{array}$	$\begin{array}{r} 48 \\ \times 92 \\ \hline \end{array}$	$\begin{array}{r} 96 \\ \times 47 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ \times 66 \\ \hline \end{array}$
16.	$\begin{array}{r} 64 \\ \times 21 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ \times 23 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ \times 36 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ \times 38 \\ \hline \end{array}$
17.	$\begin{array}{r} 58 \\ \times 26 \\ \hline \end{array}$	$\begin{array}{r} 91 \\ \times 89 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ \times 54 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ \times 39 \\ \hline \end{array}$
18.	$\begin{array}{r} 79 \\ \times 43 \\ \hline \end{array}$	$\begin{array}{r} 91 \\ \times 27 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ \times 25 \\ \hline \end{array}$	$\begin{array}{r} 58 \\ \times 54 \\ \hline \end{array}$

UNIT NINE

Multiplying Money Numbers

Mary makes 45 cents an hour working for Mrs. Lane. Last week Mary worked 18 hours. Jack and Don helped her find how much she earned.

1. Jack found his answer in this way. How could Jack check his answer?

JACK

$$\begin{array}{r} 45\text{¢} \\ \times 18 \\ \hline 360 \\ 45 \\ \hline 810\text{¢} = \$8.10 \end{array}$$

2. Mary said, "I think 810¢ is an odd way to write $8.10."

Is Mary right? Do you often see the cents sign used with amounts over a dollar? How are these amounts of money usually written?

650¢ 108¢ 2475¢ 1000¢

3. Don used a dollar sign and a cents point to show amounts of money in his multiplication. Check Don's multiplication A with Jack's. Did both boys multiply in the same way?

DON

$$\text{A.}\quad \begin{array}{r} \$.45 \\ \times 18 \\ \hline 360 \\ 45 \\ \hline \$8.10 \end{array} \qquad\qquad \text{B.}\quad \begin{array}{r} 45 \\ \times 18 \\ \hline 360 \\ 45 \\ \hline 810 \end{array}$$

4. Don did multiplication B to show that money numbers are multiplied in the same way as whole numbers. Use Don's two multiplications and make up a rule for multiplying money numbers.

Use your rule. Find the products.

$$\textbf{5.}\quad \begin{array}{r} \$.35 \\ \times 24 \\ \hline \end{array} \qquad \begin{array}{r} \$.98 \\ \times 72 \\ \hline \end{array} \qquad \begin{array}{r} \$.48 \\ \times 25 \\ \hline \end{array} \qquad \begin{array}{r} \$.12 \\ \times 98 \\ \hline \end{array}$$

Money Problems

1. Jim decided to save 35¢ a week. How much will he save in 52 weeks, or one year?

2. When bought in books, movie tickets cost $.45. How much will a book of 12 tickets cost?

3. Bob sells Sunday newspapers at 15¢ each. How much money does he collect when he sells 59 newspapers?

4. Eighteen boys formed a soft-ball club. Each boy paid 75¢ club dues. What was the total amount of the dues that the boys paid?

5. The boys in the soft-ball club wanted uniforms. One kind of uniform cost $9.95. Another kind cost $5.00. How much will a boy save if he buys the cheaper uniform?

6. Carol bought a pair of knitting needles for 59¢, some yarn for $2.50, and a knitting bag for 89¢. How much did she spend for these things?

7. Each day Tom spends 27¢ for his lunch. How much does he spend for his lunches in 25 school days?

8. Sue's mother bought Sue a $5 sweater on sale at $3.98. What change should she get if she gave the clerk a ten-dollar bill?

9. Jack's gloves cost $.98, his sweater $4.95, and his shoes $6.50. How much did the three things together cost?

10. Joan bought 12 packages of flower seed at 15¢ a package. How much did the 12 packages cost?

Write these examples ready to work. Find the answers. Remember the dollar sign. Place the cents point so there will be two places at the right of it to show cents.

11. $\begin{array}{r}\$5.12\\ .89\\ 2.75\\ \underline{+.04}\end{array}$ $\qquad$ $\begin{array}{r}\$6.98\\ \underline{-1.53}\end{array}$ $\qquad$ $\begin{array}{r}\$.95\\ \underline{\times 37}\end{array}$

12. $\begin{array}{r}\$.87\\ \underline{\times 56}\end{array}$ $\qquad$ $5\overline{)\$7.25}$ $\qquad$ $4\overline{)\$6.64}$

13. Take $12.56 from $53.24.

14. $5.08 + $.02 + $26.73 + $.98

15. $\begin{array}{r}\$.24\\ \underline{\times 53}\end{array}$ $\qquad$ $\begin{array}{r}\$.19\\ \underline{\times 65}\end{array}$ $\qquad$ $\begin{array}{r}\$.75\\ \underline{\times 26}\end{array}$ $\qquad$ $\begin{array}{r}\$.86\\ \underline{\times 94}\end{array}$

When Do You Use Addition?

Often, to work or to check an example, you have to answer an addition number question.

1. You can use addition to check your subtraction. What is the addition number question that was answered to check the subtraction below?

SUBTRACTION	CHECK
$14.15	$9.79
−9.79	+4.36
$4.36	$14.15

2. When Joe found the product of 7 × 1498, he used three "times-and" facts. (Page 176.) What number did he add to the product after he thought each of these multiplications?

JOE
1498
×7
10486

7×9 7×4 7×1

3. Multiply 35 by 24. You use addition when you carry. In what other part of this multiplication did you need to know how to add?

4. If you multiplied $4.25 by 5, how could you use addition to see if $21.25 was the correct product?

You can use addition to find out how many all together, or how many in all.

Read each of these problems. What is the addition number question that must be answered in order to solve the problem?

5. Jane has 6 dolls. Ann has 4 dolls. Together they have how many dolls?

6. What will my bill total if I spend $.45, $2.36, and $5.00?

7. Jack's team scored 5 points in the first half of a game, and 9 points in the second half. What was the total score for his team?

8. Sue used 4 eggs to make a cake. She fried 5 eggs for lunch. How many eggs did she use?

9. Bob counted 16 science books, 11 spellers, and 9 readers. How many books were there in all?

10. Mr. West paid $3.50 for gasoline, 45¢ for oil, and $1.00 for a tire change. How much was his bill for all of these things?

When Do You Use Subtraction?

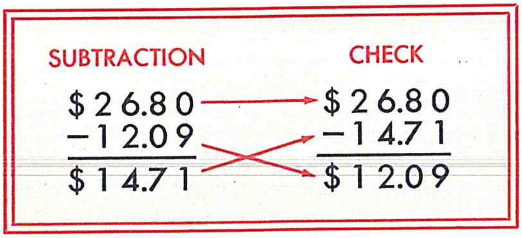
Often, to work or to check an example, you have to answer a subtraction number question.

1. Show how you could use subtraction to check the quotient Bob has found.

BOB
$$\begin{array}{r} \$.3\,0 \\ 4\overline{)\$\,1.2\,0} \end{array}$$

2. Is it sensible to use the subtraction check if you are dividing by a large number? Give your reason.

3. You can check your answer to a subtraction example by doing another subtraction. Study the work below and tell how this is done.



4. How is subtraction used in Bill's division example?

BILL
$$\begin{array}{r} 8 \\ 4\overline{)356} \\ -32\downarrow \\ \hline \boxed{?}6 \\ -\boxed{?}\boxed{?} \\ \hline \end{array}$$

You can use subtraction to answer questions like these.

- How many are left?
- How many more are needed?
- What is the difference, or how many more or less?

Read each of these problems. What is the subtraction number question that must be answered in order to solve the problem?

5. Jack had $10.00. He spent $4.65. How much did he have left?

6. Joan wants to sew 15 buttons on a dress. She has now sewed on 7 of the buttons. How many more has she to sew on the dress?

7. One store sells coffee at $.95 a pound. Another store has coffee on sale at $.79 a pound. What is the difference in price?

8. The school bus can seat 40 children. There are now 15 children sitting in the bus. There are seats for how many more?

9. A 12-in. board is how much wider than a 5-in. board?

10. Bill studied 35 minutes. Bob studied 50 minutes. Bob studied how much longer than Bill?

11. A 50-ft. rope is how much shorter than an 85-ft. rope?

When Do You Use Multiplication?

Often, to work or to check an example, you have to answer a multiplication number question.

1. Write three multiplication number questions that Sue must answer when she does this division example.

```
SUE      675
       ______
      4)2700
      - ??
        __
         30
       - ??
         __
          20
        - ??
          __
```

2. Show how Sue can use multiplication to check the answer she got when she divided 2700 by 4.

3. Show how Don can use multiplication to check the answer he got when he did this addition example.

```
 DON
 365
 365
 365
 365
+365
____
1825
```

You can use multiplication to find how many in more than one group when the groups are all the same size.

You can also get the answer by adding, but multiplying is faster.

Think what you know and what you want to find in each of these problems. Then write the number question that must be answered to solve the problem.

4. There are 8 pt. in 1 gallon. How many pints are there in 5 gallons?

5. One board is 6 ft. long. How many feet will there be in 9 of these boards?

6. A dozen eggs weigh about 26 oz. How many ounces will 12 doz. weigh?

7. Ann bought 5 cards of bobby pins. How many pins did she get if there are 15 pins on a card?

8. There are 5 boys on each team. How many will there be on 6 teams?

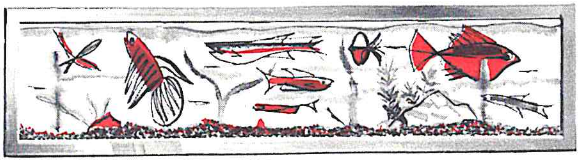
9. One apple costs 8¢. What will 9 of these apples cost?

10. At $.35 a yard, what will 5 yards of ribbon cost?

11. Tom bought 5 packages of envelopes. How many envelopes did he get if there were 8 in a package?

12. Jane bought 6 bags of candy. If there were 24 pieces of candy in each bag, how many pieces of candy did Jane get in all?

When Do You Use Division?



Often, to find the answer to a problem, you have to answer a division number question.

1. Jim has 30 tropical fish. He wants to give 6 fish to each of his friends. How many glass jars will he need if he puts 6 fish in each jar?

The following picture shows

? 6's = 30.

Bob found the answer to Jim's problem by subtracting 6's until he came to 0. He found that five 6's equal 30.

$$\begin{array}{rr} & \text{BOB} \\ & 30 \\ 1 & -6 \\ \hline & 24 \\ 2 & -6 \\ \hline & 18 \\ 3 & -6 \\ \hline & 12 \\ 4 & -6 \\ \hline & 6 \\ 5 & -6 \\ \hline & 0 \end{array}$$

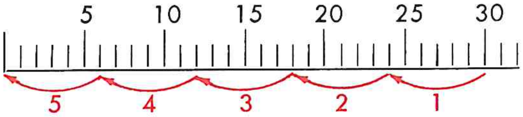
2. Bob's way is a good way to help you understand Jim's problem, but would you use this way to find how many 6's = 3000? Why?

Sue used addition to find the answer to Jim's problem. She added 6's until she reached 30.

3. Do you think Sue's way is any better than Bob's?

$$\begin{array}{rr} & \text{SUE} \\ 1 & 6 \\ 2 & +6 \\ \hline & 12 \\ 3 & +6 \\ \hline & 18 \\ 4 & +6 \\ \hline & 24 \\ 5 & +6 \\ \hline & 30 \end{array}$$

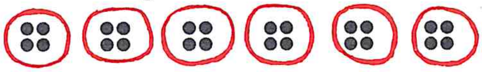
4. Jim found his answer by dividing. Study this number line. Then copy his division and write the quotient. Why is Jim's way the best way to use?



JIM

$$\begin{array}{r} 5 \\ 6\overline{)30} \\ 30 \\ \hline 0 \end{array}$$

5. Ruth has 24 cookies. If she puts 4 cookies in each bag, how many bags will she use? Study the dot drawing. Then divide.



You can use division to separate an amount into equal groups.

You can also add or subtract to find how many groups, but it is faster to divide.

Use number lines or dot drawings to help you solve these problems.

6. How many 3-foot boards can Joe cut from a board that is 15 feet long?

7. Gary planted 9 cabbage plants in a row. How many rows will it take to plant 72 plants?

8. There were 48 children in a drum and bugle corps. They marched by fours. How many groups of four would this equal?

9. The class learned 6 spelling words each day. In how many days will the class learn 96 words?

10. There are 4 quarts in a gallon. How many gallons will 72 quarts equal?

11. There are 7 days in a week. How many weeks will 84 days equal?

Find the Mistakes

There are five mistakes in Don's work. Find the examples in which there is a mistake. Copy and do each example correctly.

DON

A. $\begin{array}{r} 478 \\ \times 6 \\ \hline 2868 \end{array}$?

B. $\begin{array}{r} 307 \\ \times 9 \\ \hline 2763 \end{array}$?

C. $\begin{array}{r} \$8.15 \\ \times 4 \\ \hline \$3260 \end{array}$?

D. $\begin{array}{r} 65 \\ \times 29 \\ \hline 585 \\ 130 \\ \hline 1885 \end{array}$?

E. $\begin{array}{r} 38 \\ \times 94 \\ \hline 152 \\ 342 \\ \hline 494 \end{array}$?

F. $\begin{array}{r} \$.57 \\ \times 35 \\ \hline 285 \\ 171 \\ \hline 19.95 \end{array}$?

G. $\begin{array}{r} 7 \\ 6\overline{)420} \\ 42 \\ \hline 0 \end{array}$?

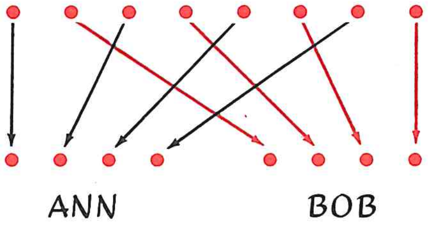
H. $\begin{array}{r} 800 \\ 3\overline{)2400} \\ 24\downarrow \\ \hline 00 \\ 00\downarrow \\ \hline 00 \\ 00 \\ \hline \end{array}$?

I. $\begin{array}{r} \$3.96 \\ 9\overline{)\$35.64} \\ 27\downarrow \\ \hline 86 \\ 81\downarrow \\ \hline 54 \\ 54 \\ \hline \end{array}$?

J. $\begin{array}{r} \$5.42 \\ 4\overline{)\$22.08} \\ 20\downarrow \\ \hline 20 \\ 20\downarrow \\ \hline 8 \\ 8 \\ \hline \end{array}$?

Another Use for Division

1. Bob has 8 lollipops. He wants to give $\frac{1}{2}$ of them to Ann. How does this dot drawing help Bob to find $\frac{1}{2}$ of 8?



2. How many children shared Bob's lollipops? Each child's share is what part of all the lollipops?

You can use division to find out how many there are in one of the equal parts.

3. Draw a dot picture to show that $\frac{1}{2}$ of $16 = 8$, or $\begin{array}{r}8\\2\overline{)16}\end{array}$.

4. Joan had 24 thumbtacks. She divided them equally among 3 children. Which picture below shows each child's share of the thumbtacks? How many were there in each child's share? Each child's share was what part of all the thumbtacks?

5. Jerry had 24 marbles. He divided them equally among 4 boys. What part of the marbles did each boy get? $\frac{1}{4}$ of $24 = \boxed{?}$.

6. Ann helped in a bake shop. When customers asked for a part of a dozen rolls, Ann had to know how to find different parts of 12.

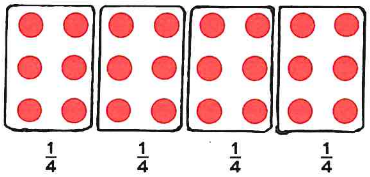
Tell what part of 12 she was trying to find when she used each of these division facts.

$\begin{array}{r}6\\2\overline{)12}\end{array}$ $\quad\begin{array}{r}4\\3\overline{)12}\end{array}$ $\quad\begin{array}{r}3\\4\overline{)12}\end{array}$ $\quad\begin{array}{r}2\\6\overline{)12}\end{array}$

7. Copy the questions asked after picture C below. Answer the questions. The picture can help you.

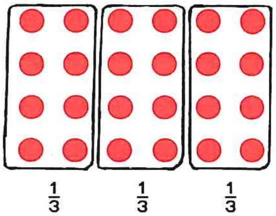
A.

$\begin{array}{r}\boxed{?}\\4\overline{)24}\end{array}$

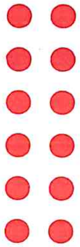


B.

$\begin{array}{r}\boxed{?}\\3\overline{)24}\end{array}$



C.



$\frac{1}{2}$ of $12 = \boxed{?}$

$\frac{1}{3}$ of $12 = \boxed{?}$

$\frac{1}{4}$ of $12 = \boxed{?}$

$\frac{1}{6}$ of $12 = \boxed{?}$

Using Division in Solving Problems

Tell in which of the following problems you have to answer a division question.

1. There are 15 problems on one page and 12 problems on another page. How many problems are there on the two pages?

2. Jack paid 35¢ for 5 apples. At this rate, what did each apple cost?

3. Jim had 15 rabbits. He sold $\frac{1}{3}$ of the rabbits to Jack. How many rabbits did Jim sell to Jack?

4. Ellen practices her piano lessons 4 hr. each week. How many hours does she practice in 9 wk.?

5. Joan saw 8 bird cages in a pet shop window. She counted 6 birds in each cage. How many birds were there in all the cages together?

6. A box contains 48 puppy cakes. If a puppy eats 4 puppy cakes a day, in how many days will he eat all the cakes in the box?

7. There are 248 pages in Tom's storybook. When he has read $\frac{1}{2}$ of the book, how many pages will he have read?

8. Jim tied 60 carrots in bunches. How many bunches did he tie if he put 5 carrots in a bunch?

No Pencils, Please!

1. One book costs $.25. What will 3 books cost?

2. Three grapefruit cost 24¢. What will one of them cost?

3. Joe sold $\frac{1}{5}$ of a box of birthday cards. There were 25 cards in the full box. How many cards did Joe sell?

4. A recipe makes 24 cookies. Jane decided to make only one half of the recipe. How many cookies will she make?

5. Joan put 15 small drinking glasses on a tray. There were already 9 tall glasses on the tray. Together, there were how many glasses on the tray?

6. Bob has 12 chicks. Tom has 20 chicks. Tom has how many more than Bob?

7. One board measures 4 ft. Another board measures 10 ft. One of these boards is how much shorter than the other?

Mixed Practice

Find the sums. Check by adding in the opposite direction.

1. $\begin{array}{r} \$0.23 \\ 1.18 \\ +.08 \\ \hline \end{array} \qquad \begin{array}{r} 327 \\ 45 \\ +167 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ 43 \\ +200 \\ \hline \end{array} \qquad \begin{array}{r} \$.75 \\ .30 \\ +2.45 \\ \hline \end{array}$

Find the differences. Check by doing a second subtraction.

2. $\begin{array}{r} 406 \\ -207 \\ \hline \end{array} \qquad \begin{array}{r} \$4.21 \\ -2.25 \\ \hline \end{array} \qquad \begin{array}{r} \$11.16 \\ -8.09 \\ \hline \end{array} \qquad \begin{array}{r} 14{,}532 \\ -3{,}659 \\ \hline \end{array}$

Find the products. Check by going over your work.

3. $\begin{array}{r} \$.89 \\ \times 9 \\ \hline \end{array} \qquad \begin{array}{r} 365 \\ \times 8 \\ \hline \end{array} \qquad \begin{array}{r} 5280 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 75 \\ \times 69 \\ \hline \end{array}$

Find the quotients. Check by multiplying.

4. $4\overline{)148} \qquad 3\overline{)1062} \qquad 5\overline{)380}$

5. $2\overline{)\$7.06} \qquad 3\overline{)1704} \qquad 9\overline{)2898}$

Find the answers.

6. $\frac{1}{3}$ of $21 = \boxed{?}$ $\qquad$ $\frac{1}{5}$ of $40 = \boxed{?}$
7. $\frac{1}{4}$ of $32 = \boxed{?}$ $\qquad$ $\frac{1}{6}$ of $24 = \boxed{?}$
8. $\frac{1}{7}$ of $14 = \boxed{?}$ $\qquad$ $\frac{1}{8}$ of $24 = \boxed{?}$
9. $\frac{1}{9}$ of $27 = \boxed{?}$ $\qquad$ $\frac{1}{2}$ of $42 = \boxed{?}$
10. $\frac{1}{2}$ of $18 = \boxed{?}$ $\qquad$ $\frac{1}{3}$ of $36 = \boxed{?}$

Riddles About Measures

Say the answers to the riddles.

1. I am $\frac{1}{4}$ of a gallon or 2 times a pint. What am I?

2. I am $\frac{1}{2}$ as heavy as a pound. How many ounces do I weigh?

3. I am 36 times an inch or 3 times a foot. What am I?

4. There are usually 365 like me in a year. What am I?

5. I am 2640 feet long. What would I be if I were twice as long?

6. I am 7 times 24 hours. What am I?

7. I am $\frac{1}{3}$ yard long or 12 times an inch. What am I?

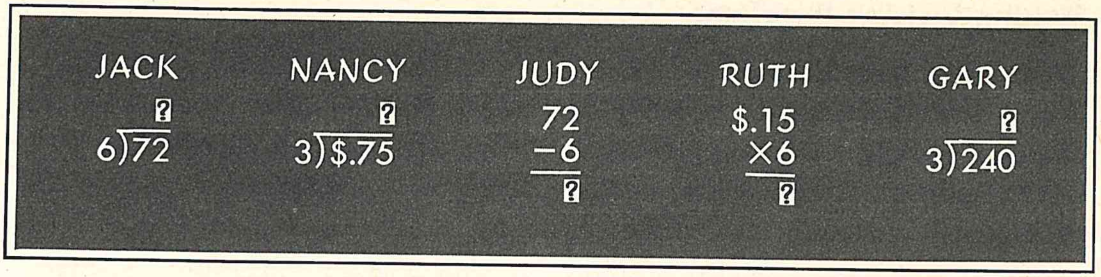
8. If you pour me into a quart milk bottle, the bottle will be $\frac{1}{2}$ full. What am I?

9. If you pour me into a bushel basket, the basket will be $\frac{1}{4}$ full. What am I?

10. I am the month that follows January. What month am I?

11. I am half of a pint or one fourth of a quart. What am I?

12. I am $\frac{1}{2}$ of a foot or $\frac{1}{6}$ of a yard. What am I?



JACK	NANCY	JUDY	RUTH	GARY
$\begin{array}{r} \boxed{?} \\ 6\overline{)72} \end{array}$	$\begin{array}{r} \boxed{?} \\ 3\overline{)\$.75} \end{array}$	$\begin{array}{r} 72 \\ -6 \\ \hline \boxed{?} \end{array}$	$\begin{array}{r} \$.15 \\ \times 6 \\ \hline \boxed{?} \end{array}$	$\begin{array}{r} \boxed{?} \\ 3\overline{)240} \end{array}$

Writing the Number Questions for Problems

The chalkboard shows the number question each child is going to answer. Read the problems and decide which problem each child is trying to solve.

1. Sue spent 15¢ for a package of needles, 35¢ for thread, and 39¢ for buttons. How much did she spend in all?

2. Bill bought 45 tulip bulbs. One fifth of them were labeled "red." How many red tulips did he buy?

3. Six children can sit at each table. How many tables will be needed to seat 72 children?

4. Mr. Brooks drives about 45 miles an hour on the highway. How many miles will he drive in 8 hours?

5. Jim needs 72 box tops to get a yo-yo. He now has 6 box tops. How many more does he need?

6. Jane paid $.75 for 3 melons. At this rate, what did each melon cost?

7. Ann has a piece of ribbon that is 72 in. long. If she cuts it into 6 equal pieces, how long will each piece be?

8. Sue saved 240 trading stamps. She gave $\frac{1}{3}$ of them to Joe. How many stamps did Joe get?

9. At $.15 a pound, what will 6 pounds of apples cost?

10. Joan bought 6 handkerchiefs for $1.50. How much did one handkerchief cost?

11. A farmer sold 15 dozen eggs. How many eggs did he sell?

12. Bob bought 3 records. Each record cost $.75. What did the 3 records cost?

Write the number question for any of the problems for which the number question has not been given on the chalkboard. Find the answers to your number questions.

Making Division Problems

Here are parts of some problems. Finish the problems by asking a division question that can be answered by using the facts in the problem.

1. Jim has 40¢. Lunch tickets cost 8¢ each.

2. There was a long line of 81 children. The teacher made the long line into three shorter lines that were equal.

3. Jerry, Bill, and Carl together caught 45 fish. They wanted to share them equally.

4. Sue bought 8 apples for 32¢.

5. Ann had 24 roses. She wanted to put the same number of roses into each of three vases.

6. There were 48 pencils in a box. One fourth of the pencils needed sharpening.

7. Mary is making badges from a piece of ribbon that is 36 in. long. Each badge is 4 in. long.

8. Betty baked a pan of 18 rolls. Each person at the breakfast table ate 3 rolls.

9. A farmer picked 48 peaches. He packed the same number of peaches in each of 6 baskets.

Answers Only

1. Write the numbers from 9994 through 10,006.

2. Multiply 458 by 10.

3. Multiply 23 by 100.

4. Find $\frac{1}{9}$ of 36.

5. Add 9 to each of these numbers. 59 26 88 97

6. If you write 842 backwards, which number will not change its place value?

7. Write a number using the figures 7, 3, 9. Have 3 in ones place, 7 in thousands place, and 9 in hundred thousands place.

8. To the difference of 9 and 17, add 10. Divide by 6.

9. Which of these numbers mean the same as $\frac{1}{4}$ of $.36?
9 $.09 9¢ 09

10. Write the next six numbers after 69,997.

11. Which is larger, XL or LX?

12. Write XLIX in our figures.

13. What is $\frac{1}{2}$ of 48?

Some Review Tests

These tests will tell you how well you can add, subtract, multiply, and divide.

Use folded paper for Test One and Test Two. Copy the examples for Tests Three, Four, and Five.

Test One

Find the sums.

1.	384	674	7738	6948
	609	38	4932	46
	+431	+190	+8005	+917
2.	507	56	9960	987
	255	449	1176	8061
	987	51	3867	59
	+800	+8	+6654	+486
3.	460	523	4563	9038
	675	97	8109	337
	237	8	3456	85
	400	237	9648	559
	+308	+38	+1155	+4380

Test Two

Find the differences.

4.	75	915	658	7732
	−48	−706	−149	−2633
5.	50	600	702	8000
	−16	−201	−345	−2605
6.	78	579	384	7617
	−45	−309	−175	−3008

Test Three

Find the products.

7.	12	74	196	215
	×8	×9	×7	×6
8.	59	35	78	67
	×26	×22	×35	×45
9.	83	43	31	71
	×78	×36	×28	×64

Test Four

Find the quotients.

10. $9\overline{)873}$ $9\overline{)738}$ $7\overline{)641}$

11. $7\overline{)245}$ $7\overline{)618}$ $8\overline{)737}$

12. $7\overline{)3759}$ $6\overline{)5706}$ $8\overline{)7856}$

13. $8\overline{)737}$ $9\overline{)840}$ $9\overline{)681}$

Test Five

Find the answers.

14. 87 + 23 + 28 + 36

15. $45.01 + $23.75 + $.14

16. 325 from 1000

17. $4.25 from $100.00

18. 36 × 48 8 × 682 53 × 29

19. $7\overline{)5376}$ $9\overline{)6741}$ $6\overline{)4734}$

No Pencils, Please!

Give answers only. After giving the answer to a problem, give the number question you used to get the answer.

1. Bill has 9 magazines left. He had 15 magazines to deliver. How many has he delivered?

2. Ann had 32 problems to do. After she finished 20 of them, how many more problems must she do?

3. Joan read a story that was 6 pages long. Jerry read a story that was 5 times as long as Joan's. How many pages long was Jerry's story?

4. Alice bought a package of 24 fancy paper napkins. She made the napkins into 6 equal packages. How many napkins did she put in each package?

5. Gary divided 24 plums equally among 6 children. How many did he give to each child?

6. Plans and materials for 3 toy planes cost 90¢. How much would the plan and material for one toy plane cost?

7. Jim paid 12¢ for a sandwich, 8¢ for an orange, and 10¢ for a bag containing 6 cookies. How much did he pay for all?

8. In making a dress, Mrs. Doe used 7 yards of lace that was $\frac{1}{2}$ in. wide. The lace cost 5¢ a yard. How much did Mrs. Doe have to pay for all of the lace?

9. The laundry charges 21¢ to launder 1 shirt. What does it cost to have 3 shirts laundered?

10. Joe picked 27 quarts of berries. He sold 15 quarts to one customer. How many quarts did he have left to sell?

11. Sue earned 35¢ yesterday and 50¢ today. How much did she earn in the two days?

12. Mr. Jones paid $15.00 for a pair of size $10\frac{1}{2}$ shoes, and $1.50 for a pair of socks. How much did he spend?

13. There are 9 rubber balls packed in each box. How many balls will I get if I buy 5 boxes?

14. There were 8 yards of ribbon in one piece, and 9 yards of the same kind of ribbon in another piece. Carol bought both pieces. How many yards of the ribbon did she buy?

15. There are 6 cookies in a box. How many boxes must I buy to get 42 cookies?

Thinking of the Meaning of Problems

Would you add, subtract, multiply, or divide to find the answer?

1. I know how much money Mother and Father each gave me. What must I do to find how much both together gave me?

2. I know how many sheets of paper I had. I know how many sheets I used. How can I find out how many sheets I have left?

3. What must I do to share a box of cookies equally among some children?

4. I bought a hat, a dress, and a pair of gloves. What must I do to find how much I spent in all?

5. I know the cost of one ticket of admission to the school play. What must I do to find the cost of more than one ticket?

6. I know how many boys there are in my school. I also know how many girls there are. What will I do to find out how many children there are in my school?

7. If I know the cost of one pair of stockings, what must I do to find the cost of several pairs?

No Pencils, Please!

1. There were 32 children in the class. The teacher divided them into four equal teams. How many were on each team?

2. The farmer had only 24 boxes of strawberries left. Three customers wanted the berries. If each got an equal share, how many boxes did each customer get?

3. Jack saw a bear that was 3 feet tall. The zoo keeper said the elephant was 3 times as tall as the bear. How tall was the elephant?

4. Mary wants to buy 15 bars of soap. The kind she wants comes packed in boxes of 5 bars. How many boxes should she buy?

5. Two classes went to play in the park. If there were 24 children in each class, how many children went to the park?

6. There are 8 envelopes in one package. How many will there be in 6 packages?

7. What is the cost of 2 dozen oranges at $.40 a dozen?

Supply the Missing Question

1. Nine boys formed a softball team. Each boy paid $4.75 club dues. What question should this problem ask?

2. The captain paid $3.95 for 5 softballs. Ask a division question.

3. Tom bought 2 gloves. He paid $3.59 for one and $3.45 for the other. Ask an addition question.

4. Softball bats were being sold at $1.98 each. Tom bought 4 bats. Ask a multiplication question.

5. The boys on the team wanted uniforms. A uniform cost $3.98. There were 9 boys on the team. Ask a multiplication question.

6. The first season the boys played 14 games. They lost 5 games. Ask a subtraction question.

7. The first time the team played, 124 boys and 45 girls watched the game. Ask an addition question.

8. At the first game, some girls sold sandwiches to make money for the team. They sold 65 sandwiches and estimated that they made $.15 on each sandwich. Ask a multiplication question.

9. In one game, the score of the winning team was 9 runs. The losing team made $\frac{1}{3}$ as many runs as the winners. Ask a division question.

Choose the Right Answer

1. There are (12, 24, 60) hours in a day.

2. A day begins at (noon, sunrise, midnight).

3. A ten-year-old boy should weigh about (85, 200, 150) pounds.

4. A comfortable room temperature is about (32°, 98°, 72°).

5. Dry measure is likely to be used to measure (eggs, sugar, fresh berries).

6. Water freezes at (32°, 212°, 70°).

Measuring Improvement — Test 9

This Improvement Test gives you another opportunity to measure how well you can add, subtract, multiply, and divide.

Begin and stop when your teacher gives the signal.

Write sums on folded paper.

1. $\begin{array}{r} 84\\ 375\\ +12\\ \hline \end{array} \qquad \begin{array}{r} 4\\ 867\\ +28\\ \hline \end{array} \qquad \begin{array}{r} 625\\ 9\\ +36\\ \hline \end{array} \qquad \begin{array}{r} 721\\ 105\\ +39\\ \hline \end{array}$

2. $\begin{array}{r} 135\\ 746\\ 270\\ +58\\ \hline \end{array} \qquad \begin{array}{r} 549\\ 317\\ 463\\ +754\\ \hline \end{array} \qquad \begin{array}{r} 984\\ 619\\ 86\\ +332\\ \hline \end{array} \qquad \begin{array}{r} 438\\ 75\\ 6\\ +282\\ \hline \end{array}$

Write the differences on folded paper.

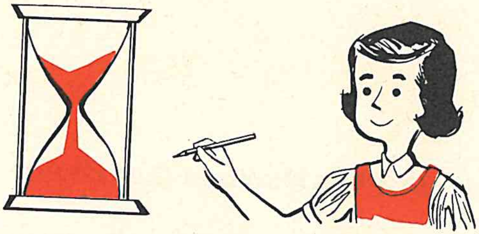
3. $\begin{array}{r} 1378\\ -9\\ \hline \end{array} \qquad \begin{array}{r} 6000\\ -3250\\ \hline \end{array} \qquad \begin{array}{r} 9834\\ -3569\\ \hline \end{array} \qquad \begin{array}{r} 659\\ -599\\ \hline \end{array}$

4. $\begin{array}{r} 835\\ -201\\ \hline \end{array} \qquad \begin{array}{r} 513\\ -132\\ \hline \end{array} \qquad \begin{array}{r} 7840\\ -67\\ \hline \end{array} \qquad \begin{array}{r} 9005\\ -2987\\ \hline \end{array}$

Copy. Find the products.

5. $\begin{array}{r} 98\\ \times 5\\ \hline \end{array} \qquad \begin{array}{r} 39\\ \times 8\\ \hline \end{array} \qquad \begin{array}{r} 176\\ \times 7\\ \hline \end{array} \qquad \begin{array}{r} 7851\\ \times 9\\ \hline \end{array} \qquad \begin{array}{r} 32\\ \times 6\\ \hline \end{array}$

6. $\begin{array}{r} 36\\ \times 59\\ \hline \end{array} \qquad \begin{array}{r} 67\\ \times 84\\ \hline \end{array} \qquad \begin{array}{r} 53\\ \times 92\\ \hline \end{array} \qquad \begin{array}{r} 68\\ \times 38\\ \hline \end{array}$



Find the quotients. Write left-over parts as remainders.

7. $6\overline{)519} \qquad 9\overline{)838} \qquad 6\overline{)550} \qquad 8\overline{)705}$

8. $7\overline{)455} \qquad 8\overline{)6072} \qquad 4\overline{)30624}$

Special Help

By this time you should be getting high scores on improvement tests.

If your work shows that you are still making mistakes, use your index to find pages of special practice.

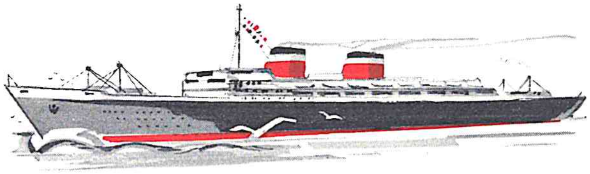
For addition, look up "addition practice." How can you tell which of the pages listed have the easiest practice? The most difficult?

For subtraction, look up "subtraction practice." Decide which pages give practice in easy subtraction. In harder subtraction.

For multiplication, look up "multiplication practice." For division, look up "division practice."

If you are making few mistakes, take the practice on the pages having harder practice. Begin with the easier practice if you are making many mistakes.

Writing the Number Question



For each problem, write the number question that you would have to answer to solve the problem.

1. Ann put 288 pieces of candy into small bags. If she put 9 pieces into each bag, how many bags did she use?

2. A steamship made a trip of 3915 miles in 5 days. How many miles would this be per day?

3. There are 24 bottles of soda in each case. How many bottles of soda will there be in 14 cases?

4. Jim bought a box of candy. There were 9 pieces in a row. There were 8 rows in the box. How many pieces of candy did Jim buy?

5. Sue asked the post office clerk for 35 four-cent stamps. The clerk gave Sue a part of a sheet that had 7 stamps in a row. There were 5 rows. Did she get the right number of stamps?

6. Mr. Brown took a boat trip from New York to Los Angeles, going by way of the Panama Canal. He said he traveled 5677 miles. Mrs. Brown flew from New York to Los Angeles. She said she traveled 2625 miles. How much shorter was her trip?

7. Mr. Brown returned to New York by air. How many miles had he traveled in going to and from Los Angeles?

8. Mrs. Smith earned $36.20 one week, $43.25 the next week, and $47.35 the following week. How much did she earn in the three weeks?

Addition Practice

▶ Write sums on folded paper.

1.	3	6	4	5	6	7
	2	7	0	4	3	1
	+4	+9	+6	+8	+7	+6
2.	7	8	5	6	0	5
	6	0	7	4	6	8
	4	4	3	5	9	7
	+5	+6	+8	+8	+9	+4
3.	4	3	7	7	2	6
	6	5	4	8	9	2
	7	9	5	6	2	7
	4	7	8	2	1	0
	+1	+6	+3	+9	+0	+8

Estimating Answers

Jerry has 41 flip cards in one stack, 18 in a second stack, and 12 in a third stack. He said, "I have about 70 cards."

1. Why did Jerry say "about 70 cards"?

2. Jerry said he estimated his answer by thinking of the nearest ten. He thought of 41 as ⍰ tens.

3. Jerry said, "4 tens + 2 tens + 1 ten = 7 tens." How did he get 4, 2, and 1?

4. Jim said there were about 90 pencils in some boxes on the shelf. The boxes were marked 39 pencils, 8 pencils, and 42 pencils. Write the numbers Jim added when he made his estimate.

In examples 5-10, round the numbers to the nearest 10 and add. Your sum should be a good estimate of the real sum.

5. 57 and 38

6. 29 and 21

7. 16, 73, and 7

8. 46, 24, and 35

9. 23, 54, and 41

10. 40, 32, and 29

11. Jane was told to estimate the number of books that were in stacks on the tables in the library. The stacks were marked 102 books, 215 books, 89 books, 95 books. Jane estimated by thinking of the nearest hundred. 215 books are about ⍰ hundreds.

12. Write the numbers that Jane added when she estimated the number of books to the nearest hundred.

Estimate the sums of the following by thinking of each number to the nearest hundred.

13. 327 + 524 + 199 = ⍰

14. 168 + 329 + 518 = ⍰

15. 278 + 489 + 187 = ⍰

16. 501 + 263 + 147 = ⍰

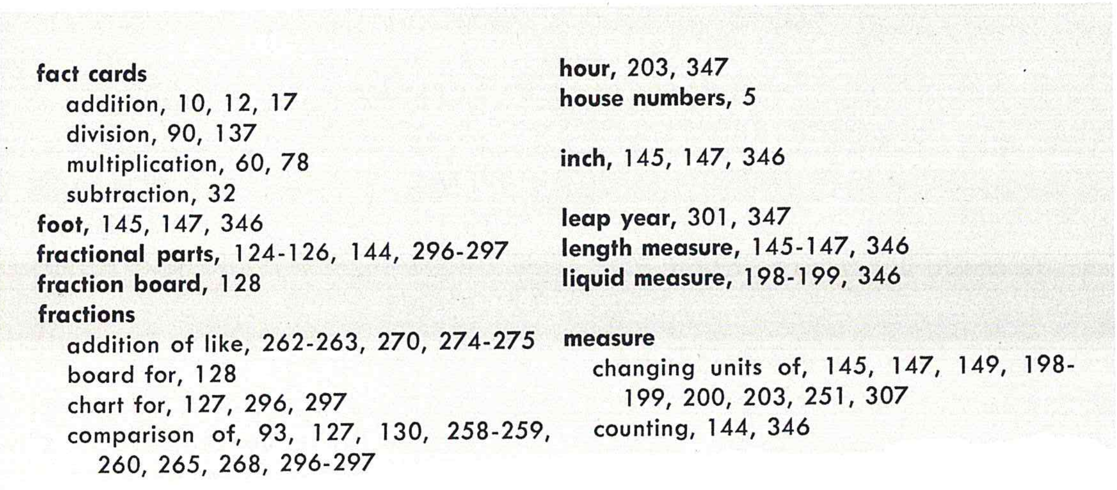
17. 260 + 315 + 200 = ⍰

18. What is the nearest thousand for each of these numbers?

899 4125 6930 5769

19. Think of the nearest thousand and estimate the sum of 2350 bricks, 1234 bricks, and 895 bricks.

20. Joe saw a sign that said, "City of Fall River, Population 111,963." Joe's father said, "About 112,000 people live here." How did his father get that number for the population?



fact cards
  addition, 10, 12, 17
  division, 90, 137
  multiplication, 60, 78
  subtraction, 32
foot, 145, 147, 346
fractional parts, 124-126, 144, 296-297
fraction board, 128
fractions
  addition of like, 262-263, 270, 274-275
  board for, 128
  chart for, 127, 296, 297
  comparison of, 93, 127, 130, 258-259, 260, 265, 268, 296-297

hour, 203, 347
house numbers, 5

inch, 145, 147, 346

leap year, 301, 347
length measure, 145-147, 346
liquid measure, 198-199, 346

measure
  changing units of, 145, 147, 149, 198-199, 200, 203, 251, 307
  counting, 144, 346

Using Measures

If you do not know or have forgotten a measure, use your index. Under "measures" the index will tell you where to find the table you are looking for.

1. David said one side of the farm fence was $\frac{1}{2}$ mi. long. How many feet long was this fence?

2. If a quart of ice cream costs $.75, what will a gallon cost?

3. How many cups can you fill from 1 pt. of milk? From 1 qt.?

4. How many weeks are there in $\frac{1}{4}$ yr.? In $\frac{1}{2}$ yr.?

5. A box of party favors is labeled $\frac{1}{4}$ gross. How much is 1 gross? How many favors are there in $\frac{1}{4}$ gross?

6. Gary said he was going on a 5-week vacation. How many days will Gary be away on his vacation?

7. A grocer poured 86 gallons of vinegar into quart bottles. How many quart bottles did he fill?

8. Mrs. Smith buys 28 quarts of milk in a month. How many gallons is this?

9. Mrs. Brown has a steam iron that gets ready for steam ironing in 2 min. How many seconds does it take for the steam to form?

10. A recipe calls for $\frac{1}{4}$ lb. of grated cheese. How many ounces of grated cheese is this?

11. A bar of chocolate is marked "10 oz." This bar is how much less than a pound?

12. Joan bought a 2-lb. can of applesauce. How many ounces of sauce does the can hold?

Remembering Things You Have Learned

1. Is 69 − 27 about 40, or about 50?

2. Is 95 − 36 about 60, or about 50?

3. Write the missing number.

4 11 ? 25

4. Write the number that means 6 thousands 2 tens.

5. Write the number that means 1 hundred thousand one.

6. Write the smallest two-place number.

7. Write the largest two-place number.

8. Write the number that means 9 more than 7 tens.

9. Write nine cents in two different ways, using figures.

10. What is the largest remainder that you can have if you are dividing by 8?

11. Which numbers from 35 to 63 can be divided evenly by 7?

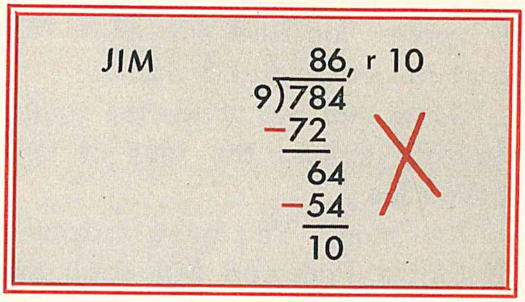
12. Which numbers between 54 and 81 can be divided evenly by 9?

13. Which of these numbers can be divided by 8 without a remainder? 63 28 72 36

14. Make a subtraction example using the numbers 19 and 32.

15. Write an example with 196 as the dividend.

16. What is a quick way to tell that Jim's division is not correct?


JIM

$$\begin{array}{r} 86, \text{ r } 10 \\ 9\overline{)784} \\ -\underline{72} \\ 64 \\ -\underline{54} \\ 10 \end{array}$$

17. What would be the correct second quotient figure in Jim's division?

18. If you were multiplying 29 by 2, would your product be about 40 or about 60?

19. Is 800 more than 9 × 82?

Subtraction Practice

▶ Write the differences on folded paper.

1.	47 − 9	94 − 15	85 − 75	34 − 19	80 − 1
2.	320 − 199	500 − 80	800 − 723	569 − 296	
3.	\$8.33 − 4.04	\$50.00 − 1.34	\$15.86 − 11.08		
4.	\$7.93 − 4.12	\$74.32 − 19.99	\$10.01 − 1.10		

What Average Means

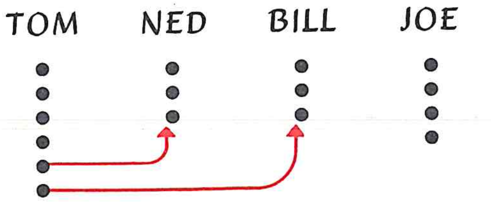
One day some apples rolled from a truck into the street in front of Tom's house.

Tom and three of his friends picked them up. Tom picked up 6 apples. Joe had 4 apples. Ned and Bill each had 3 apples.

"How shall we divide the apples equally among the four of us?" asked Joe.

Tom said, "You have 4 apples. If I give Ned and Bill each one of my apples, that will even up the numbers. We will each have 4 apples."

1. Was Tom right? Look at the picture below.



2. Bill said, "That is right. We have 16 apples all together, so each boy should have 4 apples."

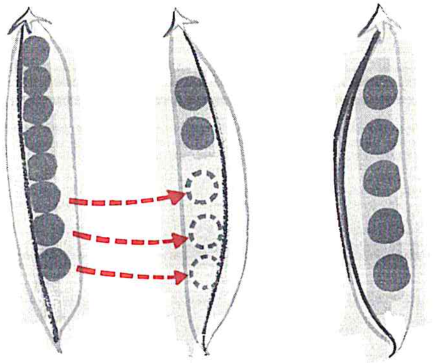
What number question did Bill answer when he said that they had 16 apples all together?

3. What number question did he answer when he said each boy's share of 16 apples was 4 apples?

A farmer opened three pods of peas. He said, "There is an average of 5 peas to the pod."

Jack said, "What does the farmer mean when he says there is an average of 5 peas to a pod? Only one of the pods has 5 peas in it."

4. Study the following drawing. What three numbers did the farmer even up or make equal? Does this help you to answer Jack's question?



5. Do you need to make a drawing in order to find the average of several amounts? Think of how Bill found each boy's share of the apples.

6. When you want to even up, or find the average, of several amounts, what kind of number question should you answer first?

7. After you have found the sum of all the amounts, what kind of number question must you answer?

Finding the Average

1. Think of the two number questions used in finding the average of several amounts. Make a rule for finding the average.

Use your rule. Find the answers to these problems.

2. There are 5 players on Jack's basketball team. The heights of the players are 57 in., 60 in., 63 in., 59 in., and 61 in. What is the average height of the players?

3. In 4 days, Tom's hens laid 6 eggs, 7 eggs, 5 eggs, and 6 eggs. This was an average of how many eggs per day? Draw a dot picture to show that your answer is right.

4. Mr. Jones drove 48 mi. the first hour, 57 mi. the second hour, and 60 mi. the third hour. What was the average number of miles he drove per hour?

5. Ruth was playing a dart game. What was her average score?

Game One	Game Two	Game Three	Game Four
15	0	9	8

There were four numbers to be averaged (15, 0, 9, and 8) in problem 5.

■ **When 0 means "not any score" or "not any amount," it is a number.**

6. Mrs. Smith paid $14.25 for 3 hats. What was the average price of each hat?

Joan said she did not need to answer two number questions to find the average price of each hat. Did she mean she did not need the addition number question or the division number question? Explain.

7. Mr. Jackson traveled 220 mi. in 5 hr. What was his average number of miles per hour?

8. Mrs. Jones baked 48 cookies. There are 8 persons in Mrs. Jones' family. What was the average number of cookies per person?

9. Mary read 24 pages of her book on Monday, 15 pages on Tuesday, 22 pages on Wednesday, and 11 pages on Thursday. What was the average number of pages she read each day?

Problems Having Two Number Questions

Jack had 75¢. How much will he have left after buying 4 candy bars at 9¢ each?

1. Ann said that you have to subtract to find how much Jack will have left. What will you subtract?

2. Write the number question that will help you find the cost of the candy Jack bought.

3. Write the number question that will help you find what Jack had left.

4. Find how much Jack had left.

Mr. Bond went to an entertainment with his 3 boys. He paid \$.25 admission for each boy and \$.35 for himself. How much did the 4 admissions cost?

5. Write the number question for finding the cost of the boys' admission.

6. The boys' 3 admissions cost \$.75. Write the number question that will find the cost of the four admissions.

Problems that have two number questions are answered in two steps. They are often called two-step problems. In the first step, you find the answer to the first number question. In the second step, you find the answer to the second number question. Study the work below.

FIRST NUMBER QUESTION	SECOND NUMBER QUESTION
$3 \times \$.25 = \boxed{?}$	$\$.75 + \$.35 = \boxed{?}$
First Step	**Second Step**
$\begin{array}{r} \$.25 \\ \times 3 \\ \hline \$.75 \end{array}$	$\begin{array}{r} \$.75 \\ +.35 \\ \hline \$1.10 \end{array}$

Write the first number question and do the first step for each of these problems.

7. Ann bought 5 yards of cloth at \$1.75 a yard. What change will she get back from a ten-dollar bill?

8. Jim had 45 magazines to deliver this week. He delivered 20 of them yesterday and 15 today. How many has he left to deliver?

9. A clerk cut 3 pieces of ribbon each 8 yd. long from a spool of ribbon. There were 50 yards on the spool when it was full. How many yards were left after the 3 pieces were cut off?

10. Joe worked 3 hr. each day for 9 days. How much did he earn if he got \$.75 an hour?

11. Bill's father got 14 gal. of gas at $.29 a gallon and a quart of 40¢ oil for his car. What did he pay the filling station attendant?

12. Jane paid 45¢ for carfare and 35¢ for lunch. How much has she left from the 95¢ that she had in her purse?

13. Don earned $1.25. Bob earned $.35 more than Don. Together they earned how much money?

For the following problems write the first number question and work the first step. Then write the second number question and work the second step.

14. A peddler bought fly swatters at 3¢ each. He sold them at 15¢ each. How much did he make in selling 24 fly swatters?

15. Jim worked 15 hr. last week and 13 hr. this week. How much did he earn in all if he got $.65 an hour?

16. Mary bought 5 books at $.59 each and a box of paints for $.89. How much did she spend?

No Pencils, Please!

Look at the sign at the right. What is the cost of the following?

1. 4 boxes of crayons.
2. 2 paint sets.
3. 5 pencils and an eraser.
4. 2 tablets and a pencil.
5. 3 boxes of crayons and a tablet.
6. 2 paint sets.
7. 9 tablets.
8. A paint set costs how much more than a tablet?
9. A paint set costs how much more than a pencil and eraser?

CLEARANCE SALE

Crayons.............	9¢ a box
Tablets.............	8¢ each
Paint Set...........	17¢ each
Pencils.............	6¢ each
Erasers.............	4¢ each

Multiplication Practice

▶ Find the products.

1. 65×78 573×7 789×4 348×9
2. 95×47 57×98 84×75 49×69
3. 39×92 81×87 26×58 70×73

Problems with One or Two Number Questions

Which of the following problems can be solved by answering one number question?

1. Mrs. West bought 2 doz. towels at $.29 each. How much did the towels cost?

2. She also bought 4 yd. of dress material at $2.75 a yard. What did she pay for the material?

3. Sweaters that had been priced at $6.00 were on sale at $3.98. How much will Bill save if he buys 2 sweaters at the sale?

4. The clerk sold 6 aprons at $.75 each. How much did he get for them?

5. A customer bought a dress that was on sale for $18.95. She made a payment of $5.00 on the dress. How much did she still owe?

6. Ann bought 7 yd. of material at $.79 a yard, and thread and buttons that cost 95¢. How much did she spend?

7. Mary bought 3 pr. of stockings at $1.19 a pair and a towel for 29¢. How much did she pay for these things?

8. Don bought a $3.98 sweater. He gave the clerk a ten-dollar bill. How much change will Don receive?

9. How much will Mrs. Smith save if she buys two of the $25 dresses that are on sale for $18.95?

10. Joan bought $2.95 worth of dress material and $.75 worth of lace. How much did both cost?

11. At a special sale, $.39 handkerchiefs were sold at $3.50 a dozen. What will I save if I buy one dozen handkerchiefs at the sale?

12. Find the answers to problems on this page which have two number questions.

13. Make up a problem with two number questions.

Practice and Review

▶ Find the quotients. Write left-over parts as remainders.

1. 4)156 3)906 5)375 8)856
2. 9)$2.79 6)$2.76 7)$9.52
3. 8)4738 9)3027 6)4738
4. 4)$13.56 8)$38.16 7)$41.44

▶ Copy. Find the answers.

1. 89 + 23 + 18 + 29 = $\boxed{?}$
2. 452 + 89 + 9 + 45 = $\boxed{?}$
3. $35.20 + $14.02 + $.04 = $\boxed{?}$
4. $2.46 + $8.65 + $.52 = $\boxed{?}$
5. $1000.00 − $1.98 = $\boxed{?}$
6. $1.41 − $.25 = $\boxed{?}$
7. 1894 − 584 = $\boxed{?}$
8. 23 from 3092 = $\boxed{?}$
9. 47 × 89 = $\boxed{?}$
10. $1.59 multiplied by 6 = $\boxed{?}$
11. 14 times 85 = $\boxed{?}$
12. 5 × 893 = $\boxed{?}$
13. 5525 ÷ 5 = $\boxed{?}$
14. $\frac{1}{7}$ of 4396 = $\boxed{?}$
15. $\frac{1}{8}$ of $35.60 = $\boxed{?}$

No Pencils, Please!

1. Give the quotients.

2)486 3)159 5)405 4)288

2. How much is $\frac{1}{3}$ of each number?

30 27 36 456

3. What number between 45 and 63 can be divided evenly by 9?

4. How much is left when you subtract a number from itself?

5. How many quarter dollars are there in one dollar? In two dollars?

6. If you had 32 quarters, how many dollars would you have?

7. Multiply each of these numbers by 10.

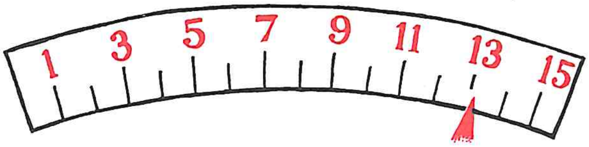
5 63 92 425 100

Write the answers.

8. Write a five-place number having 7 in hundreds place and 3 in all the other places.

9. Write a four-place number having 9 in ones place, 5 in thousands place, and show that there are no hundreds in hundreds place or tens in tens place.

10. Write in figures eleven thousand thirty.



How Well Have You Learned?

Write the answers only.

1. Tom bought a 10¢ candy bar and a 5¢ package of peanuts. How much change should he get from a quarter?

2. Would you estimate that 3 towels at 29¢ each would cost about 60¢, 40¢, or 90¢?

3. Would you estimate that 2 pairs of woolen socks at $1.98 a pair would cost about $2.00, $4.00, or $5.00?

4. What is the cost of $\frac{1}{4}$ doz. handkerchiefs at $.25 each?

5. Jane has a roll of shelf paper that is 100 ft. long. How many feet will be left on the roll after Jane cuts off 5 pieces each 6 ft. long?

6. Jim cut a 45-ft. piece of wire into 5 equal pieces. How long was each piece?

7. Tom spent $\frac{1}{2}$ of his money for his lunch. How much money did he have left? What must you know before you can give an answer?

8. Gary had $1.25. He bought 6 apples at 8¢ each. What did the apples cost? What fact in the problem is not needed?

Finish each problem by writing a word question that can be answered by using the facts given.

9. Nine girls want to write 45 invitations to a school play. Each girl wants to write her share.

10. Ann bought 2 yards of ribbon at $.59 a yard and a $.95 belt.

11. Jerry has 25¢. He wants to buy some pencils that cost 5¢ each.

For each of the following, supply the fact that is needed to complete the problem.

12. Gary wants to divide 75 bottle caps equally among some friends. How many caps will each friend receive?

13. Sue bought a $.45 ticket to the show and a 15-cent bag of popcorn. How much money did she have left?

14. Mrs. Smith said, "I will buy the cheaper dress and save $5.00." How much did her dress cost?

15. Mr. Adams bought an automobile. He agreed to pay $80 each month until the car was paid for. How many months did he have to pay?

Helping Yourself

Study page 209. Then find the answers.

1. 34 × $.75 = ?

2. 7 × $5.38 = ?

3. 89 × $.45 = ?

4. Find the cost of 39 yd. of curtain material at $.98 a yard.

Study pages 211 and 212 to review addition and subtraction problems.

Study page 213 to review multiplication problems.

Study pages 214-217 to review division problems.

Write the number question for each of these problems.

5. Bill earned $5.50. Joan earned $.75. Bill earned how much more than Joan?

6. How much do I save by buying a $15.95 garden hose when it is on sale at $9.95?

7. How many groups of 5 flags can you make from a bundle of 75 flags?

8. Mrs. Ames is going to bake 48 rolls. How many pans will she need if she bakes 8 rolls in each pan?

9. Paul paid $.75 for a kite and $.35 for a ball of string. How much did he spend?

10. Three children decide to share the work of cleaning their house. If it takes 9 hr. to clean the house, how long will each child work?

Use your index.

11. On what page can you learn about zero in the quotient?

12. On what pages can you learn about Roman numerals?

13. Without working the example, how can you tell that 6 × 59 is about 360? (227)

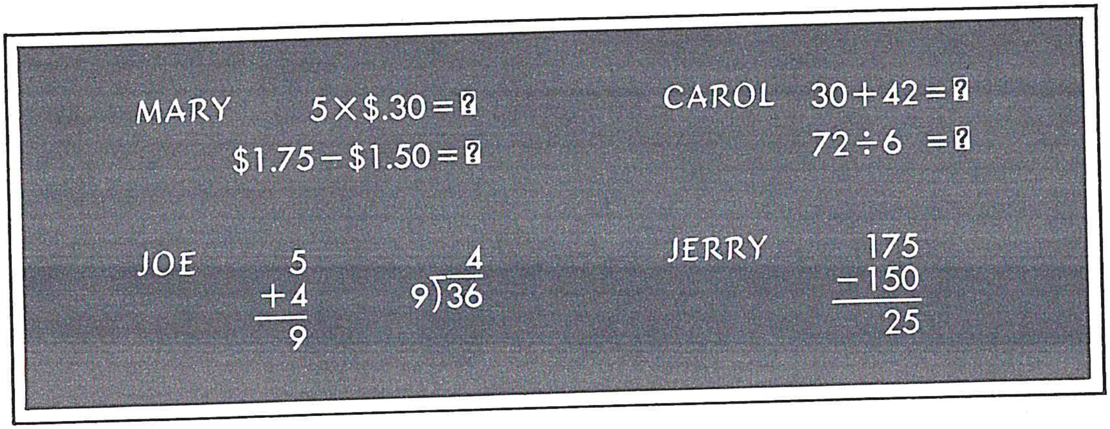
14. Without working the example, how can you tell that 513 + 206 cannot be less than 700?

15. Write the two number questions for finding the average in this problem. (230)

Alice sold 12 greeting cards Monday, 15 on Tuesday, and 25 on Wednesday. On an average, she sold how many cards per day?

16. How many number questions do you need to answer this word question?

Jack worked a total of 90 problems in 5 school days. On an average he worked how many problems a day?



MARY $5 \times \$.30 = \boxed{?}$

$\$1.75 - \$1.50 = \boxed{?}$

CAROL $30 + 42 = \boxed{?}$

$72 \div 6 = \boxed{?}$

JOE $\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$ $\qquad 9\overline{)36}$ with quotient 4

JERRY $\begin{array}{r} 175 \\ -150 \\ \hline 25 \end{array}$

How Well Are You Doing?

The children whose work you see on the chalkboard have been working the problems on this page.

Tell what problem each child was working. Then tell what number question or step the child has put on the board.

1. Bob and Ruth were selling tickets. They had 36 tickets to sell. Bob sold 4 tickets. Ruth sold 5 tickets. How many were left to sell?

2. There were 5 boys and 4 girls playing near Sue's house. Sue wanted to divide 36 cookies equally among these children. How many cookies did each child get?

3. Jim's father bought 5 gal. of gasoline at \$.30 a gallon and a car cleaner that cost \$1.75. What change will his father get if he gives the attendant \$5.00?

4. Ann wanted to earn \$1.75. After baby-sitting for 5 hr. at \$.30 an hour, how much money must she still earn?

5. Mrs. West baked 30 coconut cookies and 42 chocolate cookies. She divided them equally among 6 children. How many cookies did each child get?

6. Bob had 72 stamps. He pasted 42 of them in his stamp book. He gave $\frac{1}{6}$ of the rest to Jack. How many stamps did he give to Jack?

7. The Smith family started on a 175-mi. trip. Mr. Smith drove an average of 30 mi. per hour for 5 hr. How much farther did he have to drive?

8. Each week Sue gets an allowance of \$1.75. During the week she earns \$.30. If she saves all of her money, how much will she have in 5 wk.?

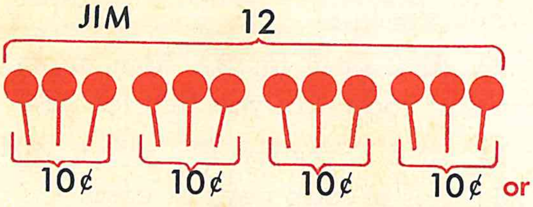
UNIT TEN

When Things Are Priced by Groups

Bill said, "Lollipops cost 3 for 10¢. I want to buy 12 lollipops, but I can't figure what 1 lollipop costs."

"You don't need to know the cost of one," Jim said. "You just pay 10¢ for every 3 lollipops that you buy. 12 ÷ 3 = 4. You pay 4 × 10¢ or 40¢."

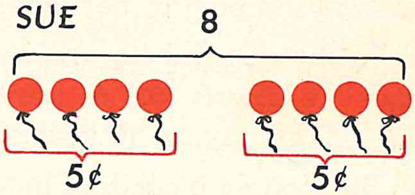
1. Explain this picture. Does it show that Jim was right?



$4 \times 10 = 40¢$

2. Draw a picture to show what 9 lollipops would cost.

3. Sue bought some balloons. Make up a word problem from the picture she made to find the cost of her balloons.



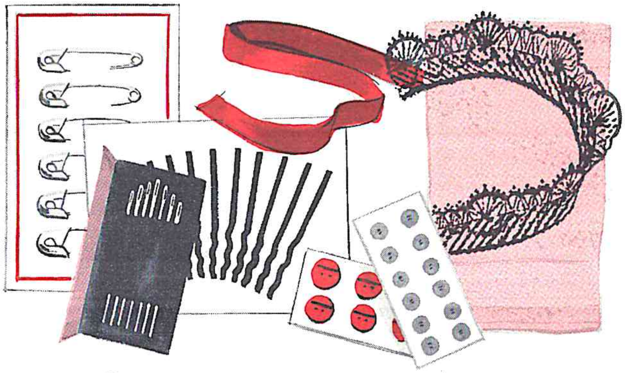
$\square + 5¢ = \square ¢$

4. Sue answered two number questions when she drew her picture. Write the number question that she answered when she drew the red brackets.

5. Complete the second number question that Sue had to answer.

6. Two candied apples cost 15¢. Ann bought 6 candied apples. Write the two number questions that she used to find how much to pay.

Lace	3 yd. - 10¢
Ribbon	4 yd. - 5¢
Towels	3 for $1.00
Buttons	2 cards - 15¢
Safety Pins	2 cards - 9¢
Needles	2 papers - 5¢
Bobby Pins	2 cards - 25¢



You Are Told the Price of More Than One

Use the prices in the picture when you do these problems.

1. Ann needs 16 yd. of ribbon to tie some packages. How much will it cost?

2. Jane bought 15 yd. of lace. What will she pay for her lace?

3. Jack wanted to give his mother 12 towels as a present. What will he pay for 12 towels?

4. Bob bought 6 cards of buttons for his shirts. What did he pay for the buttons?

Bob said, "To find the cost of 6 cards I found how many 2's equal 6. Then I knew I would have to multiply 15¢ by 3."

Use Bob's way to find what you must pay for these things.

5. 12 cards of buttons.

6. 6 cards of bobby pins.

7. 6 towels.

8. 10 papers of needles.

9. Bill has $3.00 he wants to spend for towels for a gift. How many towels can he buy?

Bill has two number questions to answer just as Bob did. Bill's first question is, "How many dollars equal $3.00?" What is his second number question? How many towels can Bill buy?

10. Tom has 25¢. How many pencils can he buy at 2 for 5¢?

11. Sue earned $.75. She wanted to spend it for oranges that sold at 4 for 25¢. How many oranges could she buy?

12. At 2 bars for 9¢, how many bars of soap can you buy for 72¢?

13. At 2 boxes for 49¢, what will 10 boxes of soap powder cost?

14. Cookies sell at 3 for 5¢. How many cookies can you buy if you have 25¢?

15. Doughnuts sell at 3 for 10¢. What will 9 doughnuts cost?

Hours of Work		
DAY	TIME	NO. OF HR.
Mon.	4 P.M. to 6 P.M.	2
Tues.	8 A.M. to 11 A.M.	3
Wed.	2 P.M. to 7 P.M.	5
Thurs.	10 A.M. to 4 P.M.	?
Fri.	9 A.M. to 1 P.M.	?

One- and Two-Step Problems in Telling Time

During spring vacation, Tom delivered groceries for Mr. Jones. Tom kept a record of the hours he worked.

1. How did Tom find the number of hours he worked on Monday? On Tuesday? On Wednesday?

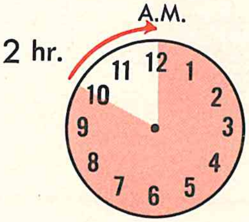
2. Make a rule for finding the number of hours when both given times are P.M. When both given times are A.M.

Tom did not know how to find the number of hours he worked on Thursday or on Friday.

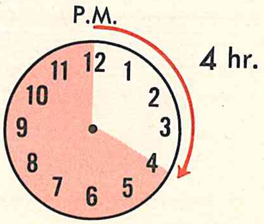
3. How is the time given on Thursday different from the time given on Monday, Tuesday, and Wednesday?

4. What do you notice about the time given for work done on Friday?

5. Sue told Tom that finding the number of hours from 10 A.M. to 4 P.M. was a problem with two steps, or two number questions. Explain the work Sue did to help Tom.



12 − 10 = ?
Answer: 2



2 + 4 = ?
Answer: ?

6. To find how many hours he worked on Friday, Tom must think:

From 9 A.M. to noon is how many hours?

The hours from 9 A.M. to noon and the afternoon hours = ?.

7. Make up a rule for finding the number of hours between two given times when one time is A.M. and the other is P.M.

8. On Saturday Tom worked from 8 A.M. to 5 P.M. How many hours did he work?

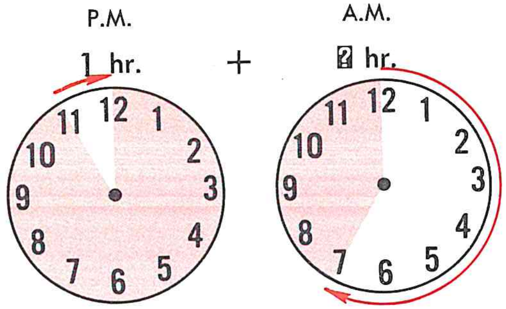
No Pencils, Please!

1. How many hours is it from 7 A.M. to 9 P.M.?

Think: 12 − 7 = ▯

▯ + 9 = ▯

2. A policeman worked from 11 P.M. to 7 A.M. How many hours did he work? The clock faces will help you.



3. Mr. Smith drove from 5 A.M. to 1 P.M. How many hours had he driven?

4. Your train left at 9 P.M. You got to the end of your trip at 10 A.M. How many hours did you travel before midnight? How many hours after midnight? How many hours did the whole trip take?

Find the number of hours from —

5. 6 A.M. to 11 A.M.
6. 2 A.M. to 4 P.M.
7. 8 P.M. to 4 A.M.
8. 5 P.M. to 11 P.M.

Answers Only

1. Write the number that is 1 more than 99,999.

2. Write the number that is 10 more than 1990.

3. Write the number that is 100 more than 900.

4. Is 7 × 49 nearer to 280, 300, or 350?

5. Is 9 × 28 nearer to 270, 180, or 200?

6. Write the answer to 20 × 25.

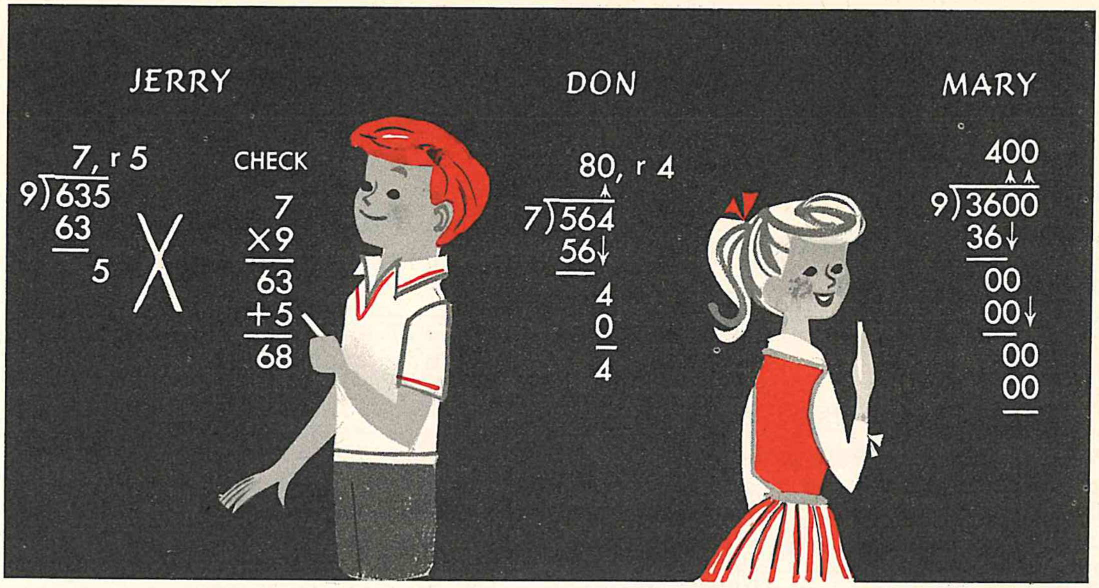
7. Write the answer to 10 × 235.

8. Write two multiplication facts that are related to this division fact: 72 ÷ 9 = 8.

9. What is the largest number that you can write with the figures in the number 107,963?

10. What is the smallest number that you can write with the figures in the number 401,279?

11. Write a number having two 0's. Put one of the zeros in ten-thousands place, and the other in hundreds place.



Zeros in the Quotient

Jerry looked at his division. He said, "I knew my division was not right. When I checked, my product was 68. It should be 635, or the same as the number I divided."

1. What mistake did Jerry make when he divided?

Don said, "I use a rule that will help Jerry."

■ **Each time you bring down a dividend figure, you must write a quotient figure. There is always a quotient figure above the last dividend figure.**

2. When Jerry brought down 5, his division step was 9)5. What figure should he have written in his quotient?

3. Explain how Mary made use of Don's rule.

▶ Copy. Keep Don's rule in mind. Find the quotient. Use multiplication to check your work.

4. 6)540 9)270 7)5600
5. 8)240 8)482 6)7200
6. 9)726 6)485 7)4200
7. 5)352 7)424 4)1920
8. 7)2240 8)3446 9)8555
9. 5)1754 7)3010 9)2700
10. 4)3400 6)3904 8)6560
11. 7)1964 5)3752 8)7524

Thinking About Division

1. Write a division fact having 56 as the dividend and 7 as the quotient.

2. Write a division question in which the dividend is 3 hundreds, 9 tens, and 6 ones, and the divisor is 3.

3. Write a division question in which the dividend is 24 tens and 8 ones. Have 8 as the divisor.

4. The dividend in a division question is 832. The divisor is 2.

How many hundreds are there to be divided by 2? How many tens? After hundreds and tens have been divided by 2, what else must be divided?

To answer this division question, you must do three divisions.

$2\overline{)800}$ $2\overline{)30}$ $2\overline{)2}$

5. When you divide $2\overline{)600}$, how do you show that your quotient figure 3 means 300?

6. How many tens will you have in the quotient when you divide $2\overline{)682}$?

7. What figure will you write in ones place in the quotient?

8. Carol divided 360 by 8. Look at her work. Why did she use 36 as her first partial dividend?

CAROL

$$\begin{array}{r} 45 \\ 8\overline{)360} \\ \underline{32} \\ 40 \\ \underline{40} \end{array}$$

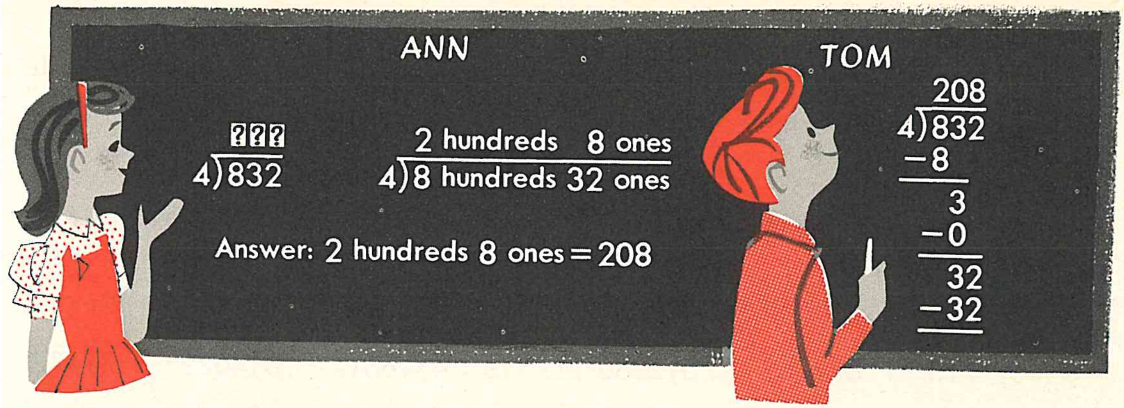
9. Why did Carol write her first quotient figure in tens place?

10. Use multiplication to see if 45 is the correct quotient for Carol's division.

No Pencils, Please!

▶ Give the quotients.

1. $3\overline{)369}$ $2\overline{)428}$ $2\overline{)120}$
2. $4\overline{)248}$ $3\overline{)123}$ $2\overline{)164}$
3. $5\overline{)155}$ $5\overline{)150}$ $3\overline{)300}$
4. $2\overline{)400}$ $4\overline{)160}$ $6\overline{)246}$
5. $4\overline{)484}$ $3\overline{)630}$ $7\overline{)140}$
6. $8\overline{)328}$ $6\overline{)300}$ $2\overline{)100}$
7. $5\overline{)355}$ $4\overline{)844}$ $3\overline{)276}$

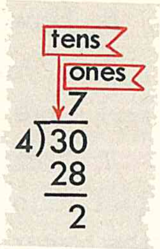


Zero in Tens Place in the Quotient

1. Can you see any way in which Ann's division is like Tom's?

2. How did Tom show that the 2 in his quotient meant 200?

3. When Tom brought down 3, it was 3 tens, or 30. Could he get a number of tens when he divided $4\overline{)30}$? How did Tom show that there were no tens in tens place in his quotient?



4. Where did Tom get the 32 that he used as his last partial dividend?

JOAN

$$\begin{array}{r} 3 \\ 8\overline{)2456} \\ \underline{24} \\ 5 \\ \underline{0} \end{array}$$

BILL

$$\begin{array}{r} 606 \\ 9\overline{)5436} \\ \underline{54} \\ 3 \end{array}$$

CARL

$$\begin{array}{r} 704 \\ 4\overline{)2819} \\ \underline{28} \\ 1 \\ \underline{0} \\ 19 \end{array}$$

BOB

$$\begin{array}{r} 7 \\ 5\overline{)3548} \\ \underline{35} \\ 4 \\ 0 \end{array}$$

▶ Use Tom's way. Copy. Find the quotients.

5. $3\overline{)924}$ $6\overline{)636}$ $2\overline{)412}$

6. Copy and finish the work of Joan, Bill, Carl, and Bob.

▶ Copy. Find the quotients.

7. $9\overline{)3654}$ $3\overline{)1524}$ $6\overline{)3054}$

8. $7\overline{)5642}$ $2\overline{)1412}$ $8\overline{)6472}$

Practicing Division

Copy. Find the quotients. Check your work by multiplying the quotient and the divisor.

1. $6\overline{)3018}$ $7\overline{)2842}$ $9\overline{)6345}$
2. $8\overline{)7248}$ $7\overline{)4249}$ $8\overline{)3272}$
3. $9\overline{)7218}$ $8\overline{)4056}$ $5\overline{)2530}$
4. $8\overline{)4832}$ $6\overline{)5430}$ $8\overline{)1648}$
5. $8\overline{)7224}$ $6\overline{)3642}$ $5\overline{)4025}$
6. $8\overline{)7264}$ $6\overline{)3642}$ $7\overline{)4249}$

Copy. Find the quotients. Write the left-over part in each example as a remainder.

7. $3\overline{)1526}$ $4\overline{)2838}$ $9\overline{)7220}$
8. $5\overline{)2549}$ $6\overline{)2417}$ $7\overline{)5638}$
9. $4\overline{)1631}$ $5\overline{)4029}$ $8\overline{)4823}$
10. $2\overline{)1815}$ $6\overline{)4221}$ $7\overline{)4967}$
11. $3\overline{)1526}$ $8\overline{)2437}$ $9\overline{)8130}$
12. $7\overline{)1454}$ $6\overline{)1829}$ $8\overline{)5637}$

Using Division

Remember: You must write a quotient figure for each number that you bring down.

In each division show all your work.

There are 2000 lb. in 1 T.

1. How many pounds equal $\frac{1}{4}$ T.?
2. How many pounds equal $\frac{1}{2}$ T.?
3. Jack said his class collected $\frac{1}{5}$ T. of old newspapers. How many pounds of paper did the class collect?

There are 5280 ft. in 1 mi.

4. A fence is $\frac{1}{4}$ mi. long. How many feet long is this fence?
5. How many feet equal $\frac{1}{2}$ mi.?
6. If you walk $\frac{1}{8}$ mi., how many feet have you walked?
7. Tom said a certain tower was $\frac{1}{3}$ mi. high. How many feet high was the tower?
8. Joan walks $\frac{1}{6}$ mi. when she walks from her front gate to the front gate of the school. How many feet does she walk in going this distance?
9. There are 204 pupils in Ruth's school. One fourth of these pupils are in a school play. How many pupils will there be in the school play?

Multiplication of Larger Numbers

There were 15 boxes of pencils in the stockroom. Each box was marked "One Gross."

1. Tom looked into one of the boxes. He found 12 dozen pencils. How could he find out how many pencils equal 1 gross of pencils?

2. How many pencils would equal 2 gross? 5 gross? 10 gross?

3. Ann wanted to find out how many pencils there were in the 15 boxes.

Ann wrote this number question: 15 × 144 = ?. Will the answer to this number question tell Ann how many pencils there are in the 15 boxes? Explain.

4. Tom and Ann tried to answer Ann's multiplication question. Who used the better way?

ANN

$$\begin{array}{rcl} 5 \times 144 & = & 720 \\ +10 \times 144 & = & 1440 \\ \hline 15 \times 144 & = & 720 + 1440 \end{array}$$

$$\begin{array}{r} 720 \\ +1440 \\ \hline 2160 \end{array}$$

TOM

$$\begin{array}{r} 144 \\ \times 15 \\ \hline 720 \\ 144 \\ \hline 2160 \end{array}$$

5. When Tom found 10 × 144, he wrote 144 as his second partial product. Ann got 1440 when she found 10 × 144. Does this mean that Tom's second partial product is wrong?

6. Study the work of these children carefully. Then copy and find the figures that are missing in each example.

BOB

$$\begin{array}{r} 156 \\ \times 23 \\ \hline ???\\ 312 \\ \hline 3588 \end{array}$$

JOAN

$$\begin{array}{r} 403 \\ \times 37 \\ \hline 2821 \\ ???? \\ \hline 14911 \end{array}$$

CARL

$$\begin{array}{r} \$2.15 \\ \times 26 \\ \hline 1290 \\ 430 \\ \hline \$???? \end{array}$$

NANCY

$$\begin{array}{r} \$3.50 \\ \times 48 \\ \hline 2800 \\ ???? \\ \hline \$168.00 \end{array}$$

▶ Copy. Find the products.

7.	428 ×36	375 ×54	694 ×18	196 ×85
8.	738 ×32	615 ×75	924 ×82	381 ×19

No Pencils, Please!

Say the products.

1. $\begin{array}{r} 100 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 300 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 200 \\ \times 6 \\ \hline \end{array} \qquad \begin{array}{r} 700 \\ \times 3 \\ \hline \end{array}$

2. $\begin{array}{r} 400 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 800 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 500 \\ \times 5 \\ \hline \end{array} \qquad \begin{array}{r} 600 \\ \times 4 \\ \hline \end{array}$

3. $\begin{array}{r} 28 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 45 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 37 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 76 \\ \times 10 \\ \hline \end{array}$

4. $\begin{array}{r} 60 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 90 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 20 \\ \times 10 \\ \hline \end{array}$

5. $\begin{array}{r} 600 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 500 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 400 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 900 \\ \times 10 \\ \hline \end{array}$

6. $\begin{array}{r} 21 \\ \times 3 \\ \hline \end{array} \qquad \begin{array}{r} 21 \\ \times 30 \\ \hline \end{array} \qquad \begin{array}{r} 25 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 25 \\ \times 20 \\ \hline \end{array}$

7. $\begin{array}{r} 12 \\ \times 3 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ \times 30 \\ \hline \end{array} \qquad \begin{array}{r} 51 \\ \times 5 \\ \hline \end{array} \qquad \begin{array}{r} 51 \\ \times 50 \\ \hline \end{array}$

8. $\begin{array}{r} 26 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 260 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 38 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 380 \\ \times 10 \\ \hline \end{array}$

9. $\begin{array}{r} 35 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 350 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 62 \\ \times 10 \\ \hline \end{array} \qquad \begin{array}{r} 620 \\ \times 10 \\ \hline \end{array}$

Practice in Multiplying

▶ Copy. Find the products.

1. $\begin{array}{r} 327 \\ \times 41 \\ \hline \end{array} \qquad \begin{array}{r} 126 \\ \times 53 \\ \hline \end{array} \qquad \begin{array}{r} 283 \\ \times 84 \\ \hline \end{array}$

2. $\begin{array}{r} 793 \\ \times 56 \\ \hline \end{array} \qquad \begin{array}{r} 375 \\ \times 76 \\ \hline \end{array} \qquad \begin{array}{r} 739 \\ \times 93 \\ \hline \end{array}$

3. $\begin{array}{r} 433 \\ \times 39 \\ \hline \end{array} \qquad \begin{array}{r} 872 \\ \times 25 \\ \hline \end{array} \qquad \begin{array}{r} 464 \\ \times 54 \\ \hline \end{array}$

4. $\begin{array}{r} 684 \\ \times 31 \\ \hline \end{array} \qquad \begin{array}{r} 972 \\ \times 26 \\ \hline \end{array} \qquad \begin{array}{r} 782 \\ \times 32 \\ \hline \end{array}$

5. $\begin{array}{r} \$5.76 \\ \times 63 \\ \hline \end{array} \qquad \begin{array}{r} \$3.24 \\ \times 28 \\ \hline \end{array} \qquad \begin{array}{r} \$2.45 \\ \times 73 \\ \hline \end{array}$

6. $\begin{array}{r} \$3.95 \\ \times 37 \\ \hline \end{array} \qquad \begin{array}{r} \$5.94 \\ \times 29 \\ \hline \end{array} \qquad \begin{array}{r} \$2.84 \\ \times 73 \\ \hline \end{array}$

7. $\begin{array}{r} \$6.78 \\ \times 91 \\ \hline \end{array} \qquad \begin{array}{r} \$1.48 \\ \times 16 \\ \hline \end{array} \qquad \begin{array}{r} \$2.04 \\ \times 35 \\ \hline \end{array}$

8. At $2.40 a gallon, how much in all will 15 gallons of ice cream cost?

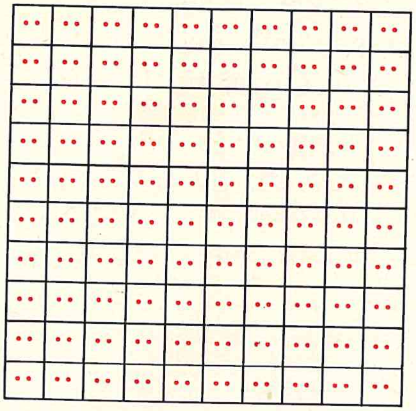
9. Judy's music lessons cost $2.75 a week. How much will her lessons cost in 48 weeks?

10. Mrs. Brown pays $9.50 a month on her clothes dryer. How much will she pay in 25 months?

11. Tom said he paid about $1.25 for each record he bought for his record player. He has 42 records. How much did he pay for all these records?

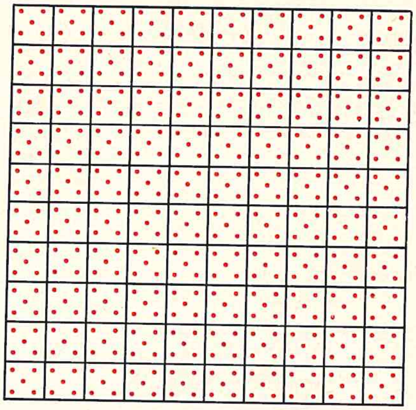
ANN

100×2=200



JIM

100×5=500



$$\begin{array}{r} 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ 10\times5=\ \ 50\\ \hline 100\times5=500 \end{array}$$

Multiplying by Hundreds

Jim studied these multiplications.

100×3=300　　100×7=700

100×6=600　　100×9=900

100×8=800　　100×4=400

Jim said, "These multiplications show that you can multiply a number by 100 by putting two zeros at the right of the number."

Ann said, "I believe I will make a drawing and see if your rule gives the right answer."

1. How many squares did Ann draw? How many dots did she put in each square?

2. Count the dots in Ann's drawings by 2's. Are there 200 dots?

Jim made a drawing, too. He counted the dots in each row of ten squares.

3. Explain how Jim's drawing and his other work each shows that 100×5=500.

Give answers only.

4. 100× 1=?　　100×23=?

5. 100×15=?　　100×35=?

6. 100×75=?　　100×12=?

7. $\begin{array}{r}12\\ \times3\\ \hline 36\end{array}$　$\begin{array}{r}12\\ \times300\\ \hline ?\end{array}$　$\begin{array}{r}5\\ \times3\\ \hline 15\end{array}$　$\begin{array}{r}5\\ \times300\\ \hline ?\end{array}$

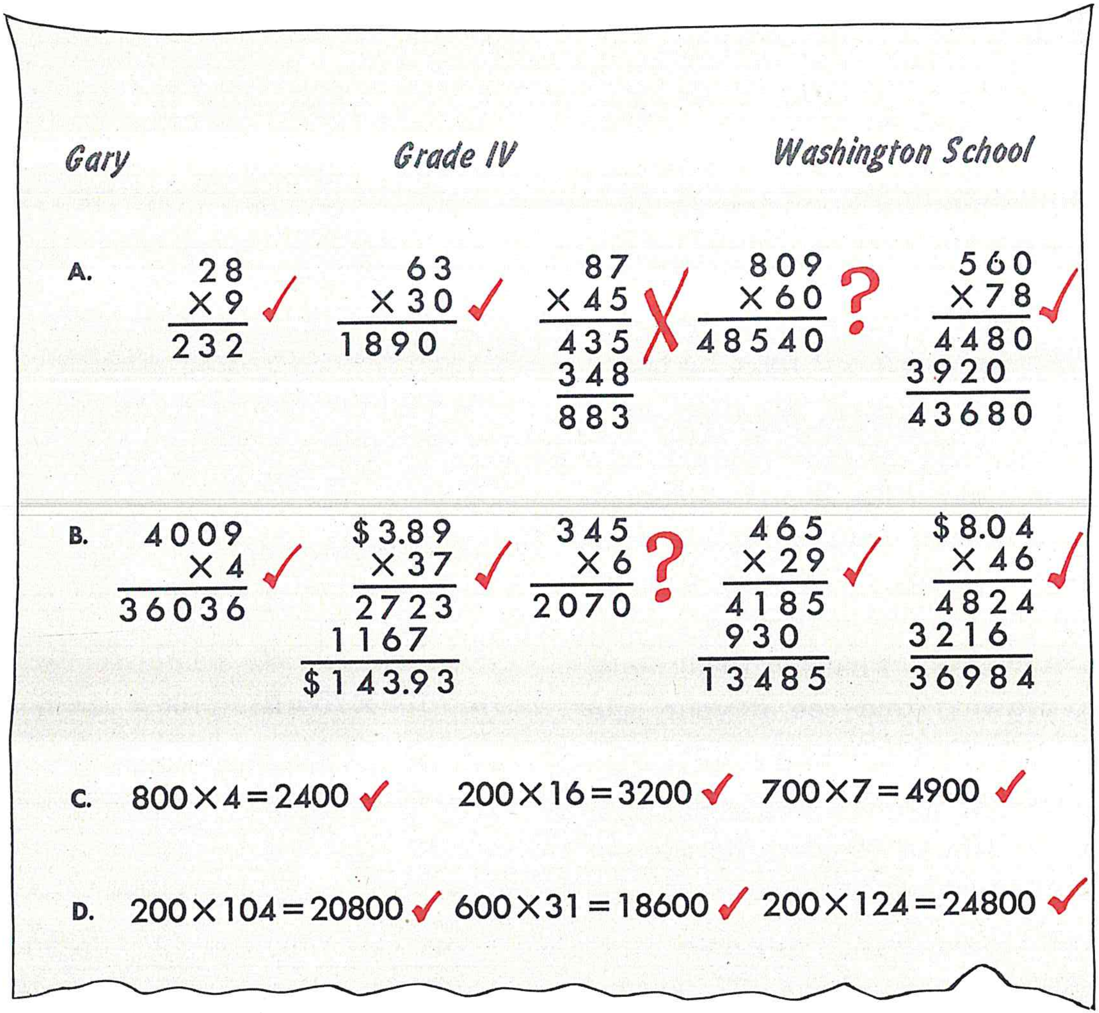
8. $\begin{array}{r}9\\ \times4\\ \hline 36\end{array}$　$\begin{array}{r}9\\ \times400\\ \hline ?\end{array}$　$\begin{array}{r}25\\ \times3\\ \hline 75\end{array}$　$\begin{array}{r}25\\ \times300\\ \hline ?\end{array}$

Checking Multiplication

Gary could not find a set of right answers to check his products. Sue said, "I will check your work by doing each multiplication again." See if Sue marked his paper correctly.

1. Copy each example. Find the product. Go over your work again, if you do not get the same answer as Gary. If you still get a different answer from Gary, try to find his mistake.

2. Sue was not sure about the examples marked with a question mark. Which of these were wrong?



Gary *Grade IV* *Washington School*

A.

$$\begin{array}{r} 28 \\ \times 9 \\ \hline 232 \end{array} ✓ \quad \begin{array}{r} 63 \\ \times 30 \\ \hline 1890 \end{array} ✓ \quad \begin{array}{r} 87 \\ \times 45 \\ \hline 435 \\ 348 \\ \hline 883 \end{array} ✗ \quad \begin{array}{r} 809 \\ \times 60 \\ \hline 48540 \end{array} ? \quad \begin{array}{r} 560 \\ \times 78 \\ \hline 4480 \\ 3920 \\ \hline 43680 \end{array} ✓$$

B.

$$\begin{array}{r} 4009 \\ \times 4 \\ \hline 36036 \end{array} ✓ \quad \begin{array}{r} \$3.89 \\ \times 37 \\ \hline 2723 \\ 1167 \\ \hline \$143.93 \end{array} ✓ \quad \begin{array}{r} 345 \\ \times 6 \\ \hline 2070 \end{array} ? \quad \begin{array}{r} 465 \\ \times 29 \\ \hline 4185 \\ 930 \\ \hline 13485 \end{array} ✓ \quad \begin{array}{r} \$8.04 \\ \times 46 \\ \hline 4824 \\ 3216 \\ \hline 36984 \end{array} ✓$$

C. 800×4=2400 ✓ 200×16=3200 ✓ 700×7=4900 ✓

D. 200×104=20800 ✓ 600×31=18600 ✓ 200×124=24800 ✓

Rules for Multiplying by Hundreds

On page 249, Jim discovered this rule.

■ **To multiply a number by 100, put two zeros at the right of the number.**

1. Use the rule above. Multiply each of these numbers by 100.

4   7   37   78   196   5000

Carol studied the following rule. Then she tried to show what the two parts of the rule mean.

■ **To multiply a number by more than one hundred, multiply by the number of hundreds. Then put two zeros to the right of the product.**

CAROL   500 × 125 = □

Part I of Rule	Part II of Rule
$\begin{array}{r} 125 \\ \times 5\square\square \\ \hline 625\square\square \end{array}$	$\begin{array}{r} 125 \\ \times 500 \\ \hline 62500 \end{array}$

2. Look at Carol's work above. Why did Carol write 500 as 5□□ when she showed Part I of the rule?

3. When Carol found 5□□ × 125, she was really finding 5 hundreds × 125. How did she show this when she wrote her first product?

▶ Copy. Find the products as Carol did.

4. $\begin{array}{r} 714 \\ \times 200 \\ \hline \end{array}$ $\begin{array}{r} 285 \\ \times 200 \\ \hline \end{array}$ $\begin{array}{r} 241 \\ \times 200 \\ \hline \end{array}$ $\begin{array}{r} 954 \\ \times 200 \\ \hline \end{array}$

5. $\begin{array}{r} 786 \\ \times 300 \\ \hline \end{array}$ $\begin{array}{r} 541 \\ \times 400 \\ \hline \end{array}$ $\begin{array}{r} 437 \\ \times 500 \\ \hline \end{array}$ $\begin{array}{r} 864 \\ \times 600 \\ \hline \end{array}$

6. $\begin{array}{r} 748 \\ \times 300 \\ \hline \end{array}$ $\begin{array}{r} 485 \\ \times 400 \\ \hline \end{array}$ $\begin{array}{r} 379 \\ \times 500 \\ \hline \end{array}$ $\begin{array}{r} 417 \\ \times 600 \\ \hline \end{array}$

No Pencils, Please!

Try to give answers quickly.

1. 1 yd. = □ in.
2. 1 mi. = □ ft.
3. 1 da. = □ hr.
4. 1 lb. = □ oz.
5. 1 T. = □ lb.
6. 1 gal. = □ qt.
7. 1 ft. = □ in.
8. 1 qt. = □ pt.
9. 1 min. = □ sec.
10. 1 dollar = □ dimes
11. 1 pair = □ things
12. 1 gross = □ things
13. 1 dollar = □ nickels
14. 1 hr. = □ min.
15. 1 doz. = □ things

Three-Figure Multipliers

A wheat and flour mill sold 4 barrels of flour to one customer, 20 barrels to a second customer, and 300 barrels to a third customer. A barrel of flour weighs 196 lb. How many pounds of flour did the three customers buy?

1. Look at the way Bill found his answer. Explain his work.

BILL

$$\begin{array}{rcr}
4\times 196 \text{ lb.} & = & 784 \text{ lb.}\\
20\times 196 \text{ lb.} & = & 3920 \text{ lb.}\\
+300\times 196 \text{ lb.} & = & +58800 \text{ lb.}\\
\hline
324\times 196 \text{ lb.} & = & 63504 \text{ lb.}
\end{array}$$

2. Look at the way Ruth and Bob found the answer. Why is Bob's way better than Bill's? Why is it better than Ruth's?

3. When Bob multiplied 196 by the 2 tens in his multiplier, how did he show that his answer was 392 tens?

4. When Bob multiplied 196 by the 3 hundreds in his multiplier, how did he show that his answer was 588 hundreds?

Copy. Use Bob's way and find the products.

5.	317 ×428	538 ×316	923 ×542
6.	634 ×431	261 ×287	421 ×353
7.	754 ×694	916 ×316	423 ×625
8.	644 ×748	714 ×168	538 ×954

RUTH

$$\begin{array}{rl}
196 & \\
\times 324 & \\
\hline
784 & (4\times 196)\\
3920 & (20\times 196)\\
58800 & (300\times 196)\\
\hline
63504 &
\end{array}$$

BOB

$$\begin{array}{r}
196\\
\times 324\\
\hline
784\\
392\\
588\\
\hline
63504
\end{array}$$

BETTY	MULTIPLY	THINK		CHECK
	196 ×824	196 ×824		824 ×196
	784	784	(4×196)	4944
	392	3920	(20×196)	7416
	1568	156800	(800×196)	824
	161504	161504		161504

Checking Multiplication with Three-Figure Multipliers

1. Explain how Betty checked her multiplication example.

Copy. Multiply. Check as Betty did.

2.	423 ×352	183 ×517	572 ×826
3.	420 ×879	496 ×684	756 ×791
4.	495 ×412	207 ×328	675 ×764
5.	521 ×463	785 ×516	627 ×234
6.	259 ×743	514 ×215	128 ×924
7.	743 ×249	832 ×185	302 ×614

8. On page 252, Bob multiplied 196 by 324. On this page, Betty multiplied 196 by 824. What happened to the size of the product?

9. If 348 × 225 = 78,300, what does 225 × 348 equal?

10. Estimate the product of 217 × 699 by rounding the numbers to the nearest hundred.

Think: 200 × 700 = ?.

Copy. Estimate the products by rounding the multiplicand and multiplier to the nearest hundred.

11.	413 ×512	106 421	398 ×685	679 ×219
12.	387 ×205	489 ×315	274 ×204	312 ×188

13. Find the exact products for the examples above. Were your estimates fairly close to the exact products?

No Pencils, Please!

1. What place does zero hold in 201? In 5230? In 6024?

2. Which number has 0 in hundreds place, eight thousand two hundred two or eight thousand twenty-two?

3. Tell how many thousands there are in each of these numbers.

493807 14099 7048 928300

4. If 100 × 124 is 12,400, then 200 × 124 is 24,800. Why?

5. If 6 eggs cost $.30, then 12 eggs cost $.60. Why?

6. Say the quotients.

$2\overline{)684}$ $3\overline{)936}$ $5\overline{)250}$ $2\overline{)1608}$

7. 8 × 7 plus ⍰ = 60.

8. 5 × 8 plus ⍰ = 48.

9. Begin with 9. Subtract 6. Multiply by 10. Divide by 5.

10. Begin with 4. Multiply by 8. Add 3. Divide by 7.

11. Multiply each of these numbers by 100.

23 7 50 235 98 400

12. Find the average of 3, 5, 4, and 8.

13. Find the average of 1, 5, 9.

14. When a number is multiplied by 0, the product is ⍰.

15. In the fraction $\frac{1}{5}$, what does the 5 tell?

16. In the fraction $\frac{2}{3}$, the 2 is called what?

17. In the fraction $\frac{4}{9}$, which figure is the denominator?

18. Does $\frac{1}{2}$ of a small apple equal $\frac{1}{2}$ of a large apple?

19. Which fraction is larger, $\frac{1}{8}$ or $\frac{1}{5}$ of the same circle? How can you tell?

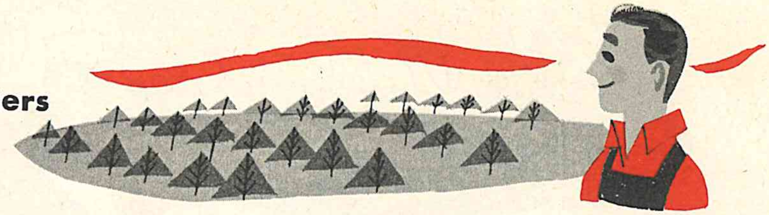
20. Which is larger, $\frac{1}{8}$ or $\frac{5}{8}$ of the same apple? How can you tell?

Mixed Practice

Write these examples ready to work. Find the answers.

1. 96 + 7 + 34 + 163 + 91 = ⍰.
2. Subtract 837 from 1000.
3. 37 × 528 = ⍰.
4. 7875 ÷ 9 = ⍰.
5. Add: $1.38, $.09, $15.23.
6. Subtract $15.06 from $175.30.
7. Multiply $4.85 by 132.
8. Divide $54.72 by 6.
9. 614 × 849 = ⍰.
10. 7 × 9305 = ⍰.
11. 613 + 274 + 56 + 103 = ⍰.

Three-Figure Multipliers Ending in Zero



Mr. Jones planted 324 small evergreens in a row. He planted 760 such rows. How many evergreen plants did he have?

1. Mary multiplied to find her answer to the problem. Don said he thought her multiplication was wrong because she had only two partial products. Is Don right?

```
MARY                          CHECK
   324                           760
  ×760                          ×324
 19440 (0×324=0)                3040
2268                           1520
246240                        2280
                              246240
```

2. What answer did Mary get when she multiplied by the 0 in ones place in her multiplier?

3. When Mary multiplied by the 6 in tens place in her multiplier, how did she show that 1944 is 1944 tens?

4. How did she show that 2268 is 2268 hundreds?

5. Copy and finish examples A, B, C, and D. Remember that when the first partial product is 0, the second partial product is written at the left of this 0. Then be sure that the next partial product means hundreds.

```
A.     197          B.      453
      ×250                 ×180
      9850                36240
      4

C.     862          D.      274
      ×370                 ×460
         0                16440
                         1096
```

Copy. Find the products. Check by multiplying.

6. 263 ×240   434 ×160   851 ×750
7. 542 ×490   711 ×520   816 ×340
8. 284 ×930   682 ×750   385 ×690
9. 538 ×124   486 ×327   420 ×463
10. 376 ×840   279 ×450   178 ×320

Zero in Tens Place in Three-Figure Multipliers

Bob's father is laying bricks from the house to the barbecue pit. Bob helped his father find out how many bricks would be needed.

1. There were 457 bricks in a row, and 209 rows were needed. Look at Bob's multiplication. How many bricks did Bob find were needed?

2. How many partial products did Bob show?

3. Why is Father's way shorter than Bob's?

4. In Father's multiplication, 9140 really stands for two partial products. Can you explain how?

▶ Copy. Use the short way and find the products. Check by multiplying.

5.	$\begin{array}{r} 937\\ \times 301\\ \hline \end{array}$	$\begin{array}{r} 468\\ \times 206\\ \hline \end{array}$	$\begin{array}{r} 476\\ \times 409\\ \hline \end{array}$
6.	$\begin{array}{r} 628\\ \times 407\\ \hline \end{array}$	$\begin{array}{r} 732\\ \times 209\\ \hline \end{array}$	$\begin{array}{r} 564\\ \times 303\\ \hline \end{array}$
7.	$\begin{array}{r} 398\\ \times 506\\ \hline \end{array}$	$\begin{array}{r} 841\\ \times 105\\ \hline \end{array}$	$\begin{array}{r} 392\\ \times 201\\ \hline \end{array}$

BOB

Long Way

$$\begin{array}{r} 457\\ 209\\ \hline 4113\\ 000\\ 914\\ \hline 95{,}513 \end{array}$$

FATHER

Short Way

$$\begin{array}{r} 457\\ 209\\ \hline 4113\\ 9140\\ \hline 95{,}513 \end{array}$$

CHECK

$$\begin{array}{r} 209\\ 457\\ \hline 1463\\ 1045\\ 836\\ \hline 95{,}513 \end{array}$$

Multiplication Practice with Zeros

▶ Copy. Find the products. Check by multiplying.

1. 503 ×382 357 ×304 540 ×126
2. 405 ×642 370 ×517 648 ×460
3. 327 ×250 507 ×129 450 ×130
4. 406 ×200 327 ×500 426 ×230
5. 284 ×457 482 ×245 488 ×535
6. 414 ×906 912 ×304 840 ×502
7. 918 ×406 200 ×104 306 ×507

No Pencils, Please!

1. At 4 for 15¢, how many apples can I buy for 30¢?

2. Extra fine sugar sells at 3 lb. for 25¢. How many pounds can I buy for $1.00?

3. Cookies are on sale at 3 packages for 50¢. How many packages can I get for $1.00?

4. In 6 days Tom rode his new bicycle 30 mi. This was an average of how many miles for each day?

5. Sue put 48 crayons in 6 equal bundles. How many did she put in each bundle?

6. There were 24 Cub Scouts on an outing. They were divided equally in 6 tents. How many Cubs were there in each tent?

7. Joan has a 20-page picture book. She has colored the pictures on $\frac{1}{5}$ of the pages. How many pages has she colored?

8. Tom's record book shows that 15 of his customers have paid their account this week, and 20 have not. How many customers does Tom have?

9. Jack has 14 rabbits. Gary has 5 less rabbits than Jack. How many does Gary have?

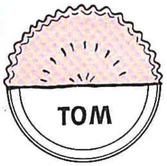
10. Bill bought a bicycle that cost $36. He is paying $4 a month on the bicycle. How many months will it take to pay for it?

11. Jane earned $.75 last week. This week she earned $1.00. This week she earned how much more than last week?

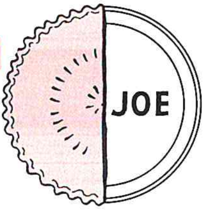
Things You Know About Fractions

1. Here are pictures of two pies. Tom ate $\frac{1}{2}$ of pie A. Joe ate $\frac{1}{2}$ of pie B. Tom says he ate as much pie as Joe did. What do you think?

A.



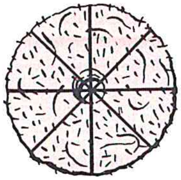
B.



2. Sue cut cake C into how many equal parts? What fraction name is given to each equal part?

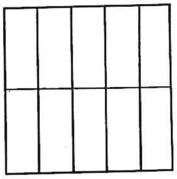
3. Sue ate 3 pieces of cake C. Write the fraction that tells what part of the cake Sue ate.

C.

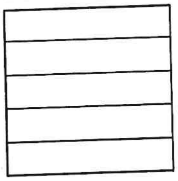


4. What fraction name is given to each equal part in square D? In square E?

D.

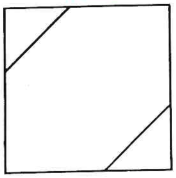


E.



5. Can you give a fraction name to each of the parts in square F? Give a reason for your answer.

F.



6. If a whole is divided into nine equal parts, what is the fraction name for each part?

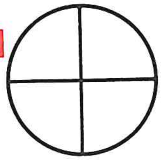
7. Draw a picture of a whole divided into thirds.

8. Use figures. Write these fractions.

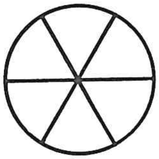
one eighth one twelfth one half

9. Write the fraction name for each of the equal parts in circle G. In circle H. In circle I. In circle J.

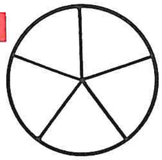
G.



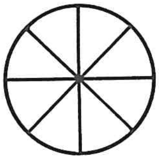
H.



I.



J.

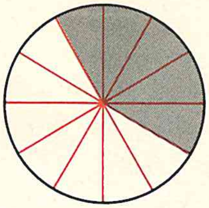


10. Which number in the fraction tells how many equal parts there are in the whole? The fractions you wrote for the circles will help you answer correctly.

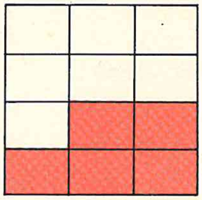
11. Jim ate $\frac{1}{8}$ of a pie. Jack ate $\frac{1}{5}$ of a pie. Who ate the larger piece if the pies were the same size? How could you tell if you did not have the pictures above to help you?

12. After Jack ate $\frac{1}{5}$ of the pie, how many equal parts were left?

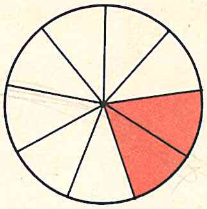
K.



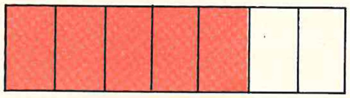
L.



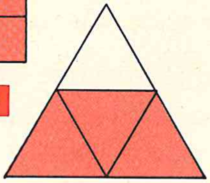
M.



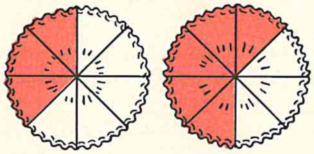
N.



O



13. Which is larger, $\frac{5}{8}$ of a pie or $\frac{3}{8}$ of a pie? How could you tell if you did not have the pictures below to help you?



14. Which is larger, $\frac{3}{4}$ of a whole or $\frac{3}{8}$ of a whole? How can you tell by looking at the fractions? Draw a picture to help you if you are not sure of your answer.

15. Circle K is divided into how many parts? One of the parts is what part of the whole? Five of the parts are shaded. What part of the circle is shaded?

16. What part of circle K is left white? Use figures and write your answer as a fraction.

17. Use numbers. Write the fraction that tells what part of each of the drawings L, M, N, and O is colored.

18. In drawing L, $\frac{7}{12}$ of the parts have been left white. Write this fraction in words.

19. In the fraction $\frac{7}{12}$, which figure tells you how many parts have been left white?

20. What part of drawing M has been left white?

21. Write the fraction that shows what part of drawing N has been left white. What figure did you write to show the size of one of the equal parts?

Division Practice

▶ Copy. Find the quotients.

1. $3\overline{)1695}$ $8\overline{)5272}$ $9\overline{)3987}$

2. $7\overline{)8575}$ $6\overline{)9720}$ $4\overline{)7996}$

3. $6\overline{)5874}$ $9\overline{)2538}$ $8\overline{)6784}$

4. $9\overline{)8631}$ $4\overline{)8456}$ $9\overline{)8451}$

5. $7\overline{)9436}$ $5\overline{)3895}$ $4\overline{)7932}$

What Is Your Answer?

1. Which of these fractions have the same denominator?

$\frac{3}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{1}{2}$ $\frac{7}{8}$

2. Which of the fractions above has the largest parts? How can you tell?

3. What name do you think when you look at the 4 in $\frac{3}{4}$?

4. How many eighths do you think when you look at the fraction $\frac{7}{8}$?

5. Write a fraction that shows that the whole has six equal parts, and that we are talking about five of these parts.

6. Write a fraction that has a denominator of 12 and a numerator of 7.

7. In the fraction $\frac{2}{9}$, the 9 is called by what name? In this fraction, what name will you give to one of the equal parts?

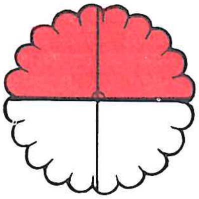
8. The 2 in $\frac{2}{9}$ is called by what name? It tells you there are how many ninths in this fraction?

9. In which of these fractions are the parts larger, $\frac{3}{8}$ or $\frac{3}{4}$?

10. In which of these fractions are there more parts, $\frac{5}{12}$ or $\frac{11}{12}$?

11. Name one of the parts in the fraction $\frac{5}{6}$.

The drawing at the right shows that $\frac{1}{2}$ of a cookie is the same as $\frac{2}{4}$ of the cookie.



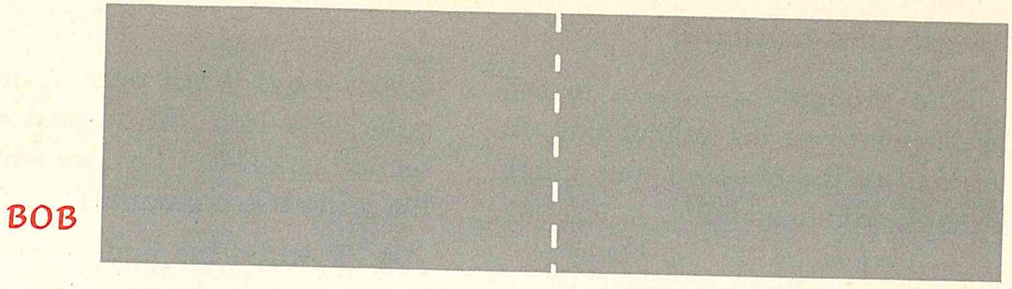
12. Make drawings to show that the following are the same.

$\frac{1}{2}$ of a cookie $=\frac{4}{8}$ of the cookie.
$\frac{1}{4}$ of a cookie $=\frac{2}{8}$ of the cookie.
$\frac{3}{4}$ of a cookie $=\frac{6}{8}$ of the cookie.

Mixed Practice

▶ Write these examples ready to work. Find the answers.

1. Add \$85.24, \$.25, \$3.98.
2. $423+14+8+283+2=$ ☐.
3. $2159+4938+4052+1436=$ ☐.
4. $\$7.00-\$2.67=$ ☐.
5. Take \$.95 from \$4.20.
6. $\$87.25-\$76.58=$ ☐.
7. $\begin{array}{r}430\\ \times 421\\ \hline\end{array}$ $\begin{array}{r}519\\ \times 302\\ \hline\end{array}$ $\begin{array}{r}286\\ \times 420\\ \hline\end{array}$
8. $\begin{array}{r}\$5.60\\ \times 254\\ \hline\end{array}$ $\begin{array}{r}\$1.04\\ \times 132\\ \hline\end{array}$ $\begin{array}{r}\$7.26\\ \times 403\\ \hline\end{array}$
9. $6\overline{)4738}$ $9\overline{)3027}$ $8\overline{)3516}$
10. $5\overline{)8925}$ $7\overline{)4639}$ $6\overline{)4950}$



Fractions That Equal One or More Than One Whole

Bob chalk-marked a strip of paper into halves. Then he wrote, "There are 2 halves, or $\frac{2}{2}$, in the whole strip."

1. What do you notice about the numerator and denominator of the fraction Bob wrote?

2. How can you tell that the fraction $\frac{2}{2}$ of an apple is all of the apple?

3. Which of these fractions mean 1 whole? That is, which of them have the same number of parts in the fraction as there are equal parts in the whole? How can you tell?

$\frac{2}{5}$ $\frac{5}{5}$ $\frac{3}{8}$ $\frac{6}{6}$ $\frac{8}{8}$ $\frac{8}{9}$

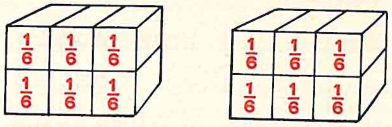
Use the drawings at the bottom of the page if you need help in giving the answers for rows 4 and 5.

4. $1 = \frac{?}{3}$ $1 = \frac{?}{9}$ $1 = \frac{?}{4}$

5. $\frac{?}{8} = 1$ $\frac{?}{2} = 1$ $\frac{?}{3} = 1$

6. Look at the picture which shows each brick of ice cream cut into sixths. The picture shows that—

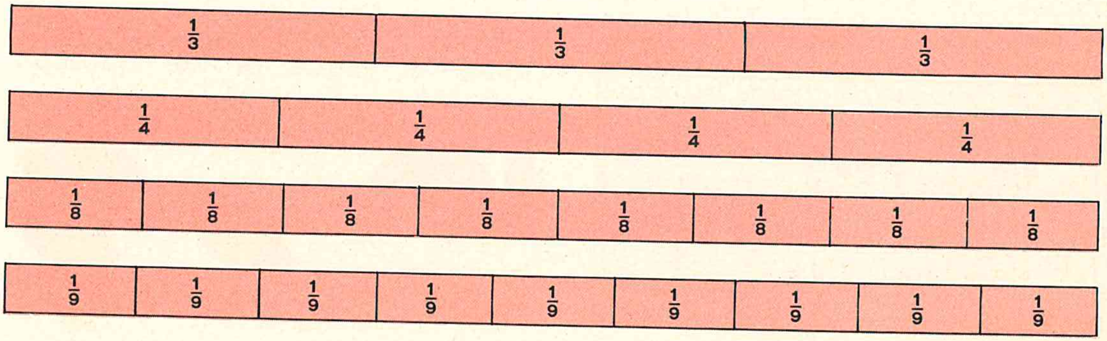
1 whole $= \frac{?}{6}$ 2 wholes $= \frac{?}{6}$ $2 = \frac{?}{6}$



7. Draw cookies and divide them to show that —

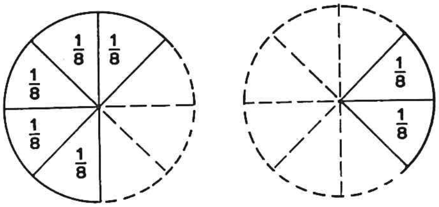
$4 = \frac{?}{3}$ $3 = \frac{?}{2}$ $5 = \frac{?}{8}$ $3 = \frac{?}{8}$

$\frac{12}{4} = \boxed{?}$ $\frac{6}{2} = \boxed{?}$ $\frac{9}{3} = \boxed{?}$ $\frac{12}{6} = \boxed{?}$



Adding Like Fractions

Joan brought two cakes to sell by the piece at the school fair. At the end of the evening, this much of each cake was left.



Joan said, "I wish we had cut only one cake. Then I would have a whole cake to take home."

1. Was Joan right? Draw a picture that shows the left-over parts of the two cakes put together. Do they equal a whole cake?

2. Ann found how much cake was left by counting. Is her answer the same as you got when you made the drawing?

$$\underbrace{\frac{1}{8}\ \frac{1}{8}\ \frac{1}{8}\ \frac{1}{8}\ \frac{1}{8}}_{\frac{5}{8}}\ \underbrace{\frac{1}{8}\ \frac{1}{8}}_{\frac{2}{8}} = \frac{7}{8}$$

3. Jim said that he could find how much cake was left in an easier way. What part of the first cake was left? What part of the second cake? In what two ways did Jim write these amounts?

JIM

$$\begin{array}{r} 5 \text{ eighths} \\ +2 \text{ eighths} \\ \hline 7 \text{ eighths} \end{array} \qquad \begin{array}{r} \frac{5}{8} \\ +\frac{2}{8} \\ \hline \frac{7}{8} \end{array}$$

4. How did Jim find the answer? Is his answer the same as Ann's?

5. Ann asked Jim why he added the numerators and did not make any change in the denominators. Can you tell Ann why Jim did not change the denominator when he found the sum?

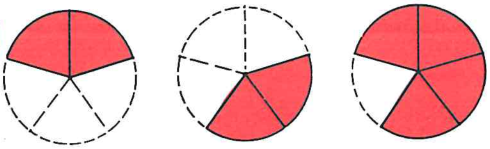
6. Jim said that you can add like fractions. What do you think he meant by like fractions?

7. Did Jim add like fractions when he found how much cake was left? How can you tell?

Fractions are like fractions when the size of their equal parts is the same. That means that like fractions have the same denominators.

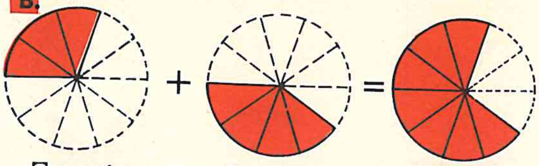
8. Each row of pictures shows an addition of like fractions. Study the pictures. Then tell what belongs in place of the question marks.

A.



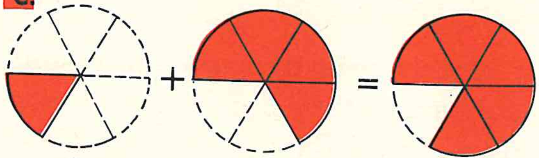
? fifths + 2 fifths = ? fifths

B.



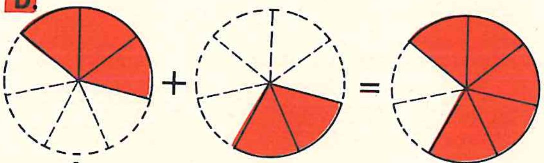
? tenths + ? tenths = ? tenths

C.



$\frac{?}{6} + \frac{?}{6} = \frac{?}{6}$

D.



$\frac{?}{7} + \frac{?}{7} = \frac{?}{7}$

9. 4 ninths + 3 ninths = ? ninths.

10. 1 fifth + 3 fifths = ? fifths.

11. The sum of 3 eighths and 2 eighths is ? eighths.

12. $\frac{1}{3}+\frac{1}{3}=\frac{?}{3}$

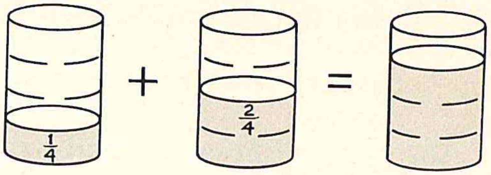
13. $\frac{2}{5}+\frac{2}{5}=?$

14. $\frac{5}{12}+\frac{2}{12}=?$

15. $\frac{3}{10}+\frac{6}{10}=?$

16. Mary studied $\frac{1}{5}$ of her spelling words last evening, and $\frac{1}{5}$ of them today. What part of her spelling words has she studied?

17. Mother had $\frac{1}{4}$ glass of cream and $\frac{2}{4}$ glass of milk. She poured them together into one glass. How full was this glass?



18. Don ate $\frac{2}{8}$ of a cake. Ann ate $\frac{2}{8}$ of the cake. Together they ate what part of the cake?

19. Try to make a rule for adding fractions.

Copy. Use your rule and find the sums.

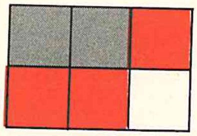
20.
$$\begin{array}{r}\frac{1}{5}\\+\frac{2}{5}\\\hline\end{array}\quad\begin{array}{r}\frac{3}{8}\\+\frac{2}{8}\\\hline\end{array}\quad\begin{array}{r}\frac{4}{8}\\+\frac{1}{8}\\\hline\end{array}\quad\begin{array}{r}\frac{3}{6}\\+\frac{2}{6}\\\hline\end{array}\quad\begin{array}{r}\frac{1}{4}\\+\frac{2}{4}\\\hline\end{array}\quad\begin{array}{r}\frac{3}{10}\\+\frac{6}{10}\\\hline\end{array}$$

21.
$$\begin{array}{r}\frac{5}{12}\\+\frac{6}{12}\\\hline\end{array}\quad\begin{array}{r}\frac{2}{12}\\+\frac{5}{12}\\\hline\end{array}\quad\begin{array}{r}\frac{3}{9}\\+\frac{1}{9}\\\hline\end{array}\quad\begin{array}{r}\frac{1}{9}\\+\frac{6}{9}\\\hline\end{array}\quad\begin{array}{r}\frac{3}{7}\\+\frac{3}{7}\\\hline\end{array}\quad\begin{array}{r}\frac{2}{12}\\+\frac{3}{12}\\\hline\end{array}$$

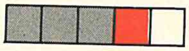
22.
$$\begin{array}{r}\frac{1}{8}\\+\frac{2}{8}\\\hline\end{array}\quad\begin{array}{r}\frac{3}{5}\\+\frac{1}{5}\\\hline\end{array}\quad\begin{array}{r}\frac{2}{7}\\+\frac{1}{7}\\\hline\end{array}\quad\begin{array}{r}\frac{3}{12}\\+\frac{5}{12}\\\hline\end{array}\quad\begin{array}{r}\frac{2}{9}\\+\frac{4}{9}\\\hline\end{array}\quad\begin{array}{r}\frac{6}{8}\\+\frac{1}{8}\\\hline\end{array}$$

23. Add the colored part and the shaded part in each drawing. Then find an addition in rows 20-22 that the drawing shows.

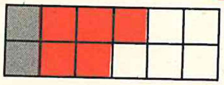
E.



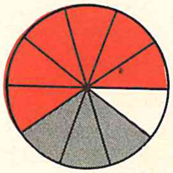
F.



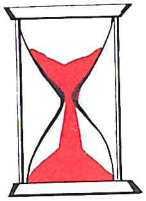
G.



H.



Measuring Improvement — Test 10



This test will help you find out if you are continuing to improve in addition, subtraction, multiplication, and division.

The teacher will give you the signal to begin and the signal to stop.

Write the sums on folded paper.

1. $\begin{array}{r}35\\7\\18\\+23\\\hline\end{array}\qquad\begin{array}{r}4874\\6240\\+9254\\\hline\end{array}\qquad\begin{array}{r}3285\\304\\783\\+3806\\\hline\end{array}\qquad\begin{array}{r}\$40.60\\7.09\\38.25\\+.95\\\hline\end{array}$

2. $\begin{array}{r}137\\648\\539\\+423\\\hline\end{array}\qquad\begin{array}{r}715\\68\\29\\524\\+53\\\hline\end{array}\qquad\begin{array}{r}\$.90\\.05\\.27\\.62\\+.15\\\hline\end{array}\qquad\begin{array}{r}\$1.04\\.78\\.46\\5.00\\+8.49\\\hline\end{array}$

Write the differences on folded paper.

3. $\begin{array}{r}56\\-30\\\hline\end{array}\qquad\begin{array}{r}906\\-596\\\hline\end{array}\qquad\begin{array}{r}5000\\-7\\\hline\end{array}\qquad\begin{array}{r}\$7.85\\-2.79\\\hline\end{array}$

4. $\begin{array}{r}500\\-94\\\hline\end{array}\qquad\begin{array}{r}356\\-238\\\hline\end{array}\qquad\begin{array}{r}784\\-59\\\hline\end{array}\qquad\begin{array}{r}\$29.95\\-9.08\\\hline\end{array}$

Copy these examples. Find the products.

5. $\begin{array}{r}59\\\times 27\\\hline\end{array}\qquad\begin{array}{r}\$.36\\\times 45\\\hline\end{array}\qquad\begin{array}{r}204\\\times 9\\\hline\end{array}\qquad\begin{array}{r}\$1.27\\\times 3\\\hline\end{array}$

6. $\begin{array}{r}409\\\times 26\\\hline\end{array}\qquad\begin{array}{r}350\\\times 246\\\hline\end{array}\qquad\begin{array}{r}712\\\times 230\\\hline\end{array}\qquad\begin{array}{r}526\\\times 302\\\hline\end{array}$

Copy these examples. Find the quotients. Write any left-over part as a remainder.

7. $2\overline{)\$4.50}\qquad 7\overline{)6041}\qquad 9\overline{)7695}$

8. $5\overline{)2637}\qquad 8\overline{)9046}\qquad 9\overline{)6683}$

9. $6\overline{)\$18.06}\qquad 5\overline{)\$21.60}$

Check your answers with a set of correct answers.

Write the date, the number you got right, and the number of minutes you worked on your paper.

Compare your work on this test with your earlier improvement tests. You can see that your work is now much more difficult than when you took your first test. Did you do as well on this test as on most of your earlier tests?

Take each of the first 6 improvement tests again. Do you find them very easy? Can you do all the work perfectly?

Review Problems

1. At 4 for 25¢, what will 12 apples cost?

2. Jim sold 35 dozen eggs. He sold them at $.55 a dozen. How much did he get for the eggs?

3. At $2.95 a yard, what will 8 yards of curtain material cost?

4. Mrs. Smith paid $6.50 for a pair of shoes, and bought two pairs of stockings at $1.65 a pair. How much did she spend in all?

5. Jerry earned $2.75 the first week, $3.50 the second week, and $2.75 the third week. What were his average earnings per week?

6. Mr. Jones had $785.80 in his bank. He took out $125.00. How many dollars did he have left in the bank?

7. Mr. West bought a car that cost $3200. The dealer allowed Mr. West $895 for his old car. How much did Mr. West have left to pay on the new car?

8. In how many weeks will Mrs. Jones pay for her $285 washer if she pays $5 each week?

What Do You Think?

Do you think that these statements are true? Tell why you answer as you do.

1. Bob says that $\frac{3}{4}$ is a larger fraction than $\frac{3}{8}$.

2. Jim says that $\frac{9}{9}$ of a cake is the same as the whole cake.

3. Alice says that 2 sixths of a pie and 3 sixths of it equal 5 sixths of the pie.

4. Bill says that $\frac{1}{4}$ of 36 is the same as $4\overline{)36}$.

5. Joan said she ate $\frac{3}{8}$ of a cake. Tom says he knows the cake was cut into 8 equal pieces.

6. A whole thing has $\frac{4}{4}$ in it.

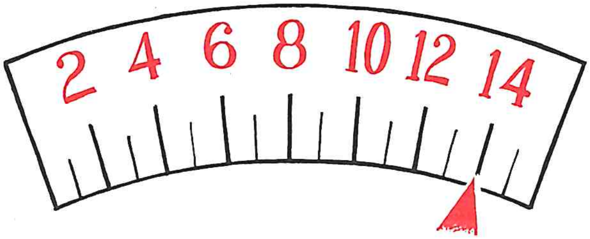
7. If you eat $\frac{1}{6}$ of a pie, the rest of the pie can be cut into 5 equal pieces like the part you ate.

8. The fractions $\frac{1}{10}$, $\frac{9}{10}$, and $\frac{3}{10}$ are like fractions.

9. In the fraction $\frac{1}{2}$ the denominator tells that the whole is divided into halves.

10. Ann ate $\frac{2}{5}$ of a pie. The top part of the fraction tells the number of equal parts Ann ate.

How Well Have You Learned?



1. Copy and finish this multiplication example.

$$\begin{array}{r} 368 \\ \times 204 \\ \hline 1472 \\ 0 \end{array}$$

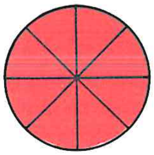
2. What will be the cost of 5 records for a record player if each record costs $1.45?

3. How many partial products will you write if you multiply 245 by 350?

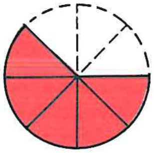
4. If candy bars are selling at 3 for 20¢, what will you do to find the cost of 6 of these candy bars.

Think of these circles as cakes cut into equal parts.

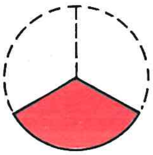
A.



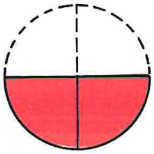
B.



C.



D.



5. Write a fraction that will tell what part of A is colored.

6. Write a fraction that will tell what part of B is not colored.

7. Two pieces of cake C are gone. Write a fraction that will tell what part of C is left.

8. Two pieces of cake D are gone. If one of these pieces were put back, what part of the cake would be on the plate?

9. Which of these fractions are like fractions? $\frac{1}{2}$ $\frac{5}{8}$ $\frac{2}{3}$ $\frac{7}{8}$ $\frac{1}{8}$

Copy. Find the sums.

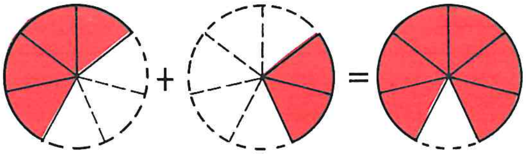
10.
$$\begin{array}{r} \frac{1}{6} \\ +\frac{4}{6} \\ \hline \end{array} \quad \begin{array}{r} \frac{5}{12} \\ +\frac{2}{12} \\ \hline \end{array} \quad \begin{array}{r} \frac{3}{7} \\ +\frac{2}{7} \\ \hline \end{array} \quad \begin{array}{r} \frac{2}{9} \\ +\frac{5}{9} \\ \hline \end{array} \quad \begin{array}{r} \frac{1}{3} \\ +\frac{1}{3} \\ \hline \end{array} \quad \begin{array}{r} \frac{2}{4} \\ +\frac{1}{4} \\ \hline \end{array}$$

11. Write a fraction with a denominator of 7.

12. Which of these fractions equal one whole? $\frac{1}{2}$ $\frac{3}{5}$ $\frac{4}{4}$ $\frac{2}{3}$

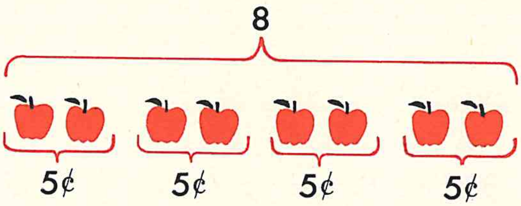
13. When you add like fractions what part of the fractions do you add?

14. Use figures. Write the addition this picture shows.



Helping Yourself

1. Write a word problem from this picture. (239)



2. The school picnic lasted from 8:00 A.M. to 5:00 P.M. Draw two clock faces and show how many hours the picnic lasted. Then use numbers and show how to find the number of hours from 8:00 A.M. to 5:00 P.M. (241, 242)

Find the quotients. Show all of your work.

3. $8\overline{)960}$ $5\overline{)2500}$ $6\overline{)243}$ (243)

4. $7\overline{)4249}$ $4\overline{)4332}$ (245)

5. Write a fraction for each of pictures A, B, and C that will tell what part of each picture is colored. (258)

6. Use figures. Write the addition example that picture D shows.

7. What parts of the fractions do you add when you add like fractions?

8. What parts of the fractions do not change when you add like fractions? (262, 263)

Write the products only.

9. $\begin{array}{r}489\\ \times 100\\ \hline\end{array}$ $\begin{array}{r}250\\ \times 100\\ \hline\end{array}$ $\begin{array}{r}124\\ \times 200\\ \hline\end{array}$ $\begin{array}{r}112\\ \times 400\\ \hline\end{array}$

Copy. Find the products.

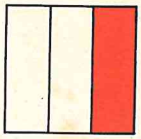
10. $\begin{array}{r}268\\ \times 37\\ \hline\end{array}$ $\begin{array}{r}843\\ \times 36\\ \hline\end{array}$ $\begin{array}{r}\$4.25\\ \times 23\\ \hline\end{array}$ (249)

11. $\begin{array}{r}356\\ \times 234\\ \hline\end{array}$ $\begin{array}{r}475\\ \times 137\\ \hline\end{array}$ $\begin{array}{r}390\\ \times 425\\ \hline\end{array}$ (252)

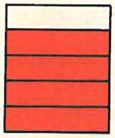
12. $\begin{array}{r}452\\ \times 230\\ \hline\end{array}$ $\begin{array}{r}316\\ \times 410\\ \hline\end{array}$ $\begin{array}{r}361\\ \times 320\\ \hline\end{array}$ (255)

13. $\begin{array}{r}326\\ \times 403\\ \hline\end{array}$ $\begin{array}{r}512\\ \times 305\\ \hline\end{array}$ $\begin{array}{r}281\\ \times 602\\ \hline\end{array}$ (256)

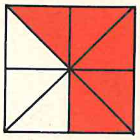
A.



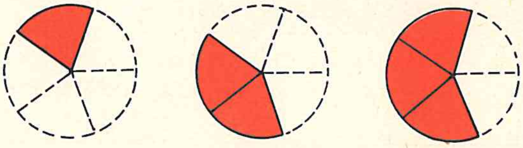
B.



C.



D.



How Well Are You Doing?

1. If you multiply 375 by 502, how many partial products will you write?

2. If you multiply 628 by 248, how many partial products will you write?

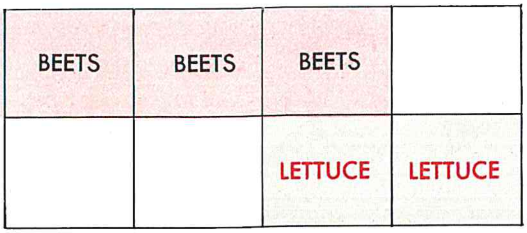
3. What is a quick way to multiply a number like 35 or 218 by 100?

4. If $3 \times 316 = 948$, what is 300×316?

5. The numerator and the denominator of a fraction are called the terms of the fraction. Which term of a fraction tells the number of equal parts in the whole?

6. Write a fraction that shows that the whole has 4 equal parts, and that we are talking about 3 of the parts.

Jerry made this drawing of the garden he began planting.



BEETS	BEETS	BEETS	
		LETTUCE	LETTUCE

7. Write the fraction that tells what part of his garden has been planted with beet seeds.

8. What part of Jerry's garden did he plant in lettuce?

9. How many of the parts of his garden has Jerry planted? Write a fraction that shows what part of his garden he has planted.

10. Write a fraction that will tell what part of Jerry's garden has not been planted.

11. Write two like fractions.

12. Use figures. Write 5 twelfths and 2 twelfths = ☐ twelfths. Add.

Copy. Find the sums.

13. $\begin{array}{r}\frac{2}{5}\\ +\frac{2}{5}\\ \hline\end{array}$ $\begin{array}{r}\frac{4}{7}\\ +\frac{2}{7}\\ \hline\end{array}$ $\begin{array}{r}\frac{5}{9}\\ +\frac{3}{9}\\ \hline\end{array}$ $\begin{array}{r}\frac{1}{3}\\ +\frac{1}{3}\\ \hline\end{array}$ $\begin{array}{r}\frac{3}{8}\\ +\frac{4}{8}\\ \hline\end{array}$ $\begin{array}{r}\frac{7}{12}\\ +\frac{4}{12}\\ \hline\end{array}$

Copy. Find the quotients.

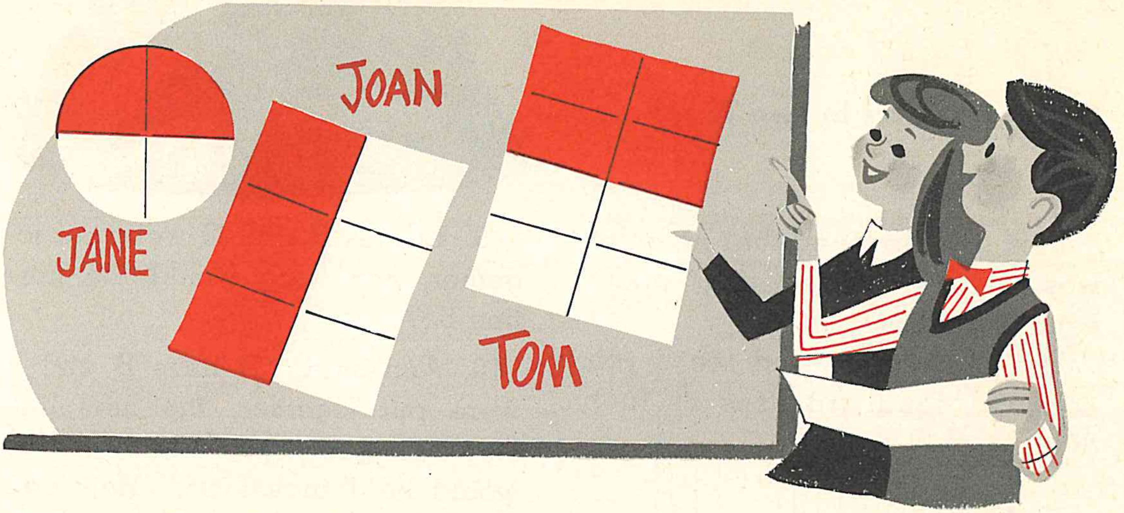
14. $4\overline{)1600}$ $5\overline{)5290}$ $6\overline{)3612}$

Copy. Find the products.

15. $\begin{array}{r}561\\ \times 49\\ \hline\end{array}$ $\begin{array}{r}603\\ \times 258\\ \hline\end{array}$ $\begin{array}{r}825\\ \times 430\\ \hline\end{array}$ $\begin{array}{r}\$4.50\\ \times 17\\ \hline\end{array}$

16. $\begin{array}{r}219\\ \times 302\\ \hline\end{array}$ $\begin{array}{r}515\\ \times 300\\ \hline\end{array}$ $\begin{array}{r}356\\ \times 104\\ \hline\end{array}$ $\begin{array}{r}350\\ \times 240\\ \hline\end{array}$

UNIT ELEVEN



Different Fractions Can Mean Equal Amounts

1. Jane cut out a circle. She folded it into 4 equal parts. She colored 2 of the equal parts.

Jane said she colored $\frac{2}{4}$ of the circle. Tom said she colored $\frac{1}{2}$ of it. Who do you think was right? Look at the picture above.

2. Tom folded a sheet of paper into equal parts. He colored 4 of the equal parts. Write two fractions that tell what part of the paper he colored.

3. Joan folded a paper into equal parts. She colored 3 of them. Write two fractions that tell what part of the paper she colored.

4. For each circle shown at the bottom of the page, write two fractions that tell how much of the circle is colored.

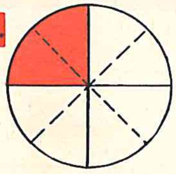
5. For each circle, write two fractions that tell how much of the circle is not colored.

Find pictures on this page that show the following.

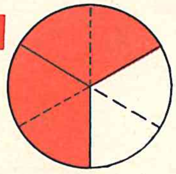
6. $\frac{2}{4}=\frac{1}{2}$ $\frac{6}{8}=\frac{3}{4}$ $\frac{4}{6}=\frac{2}{3}$

7. $\frac{2}{6}=\frac{?}{3}$ $\frac{2}{8}=\frac{?}{4}$ $\frac{3}{6}=\frac{?}{2}$

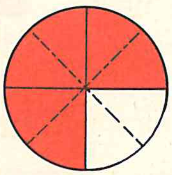
A.



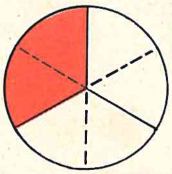
B.



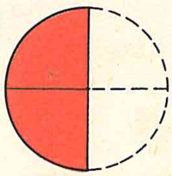
C.



D.



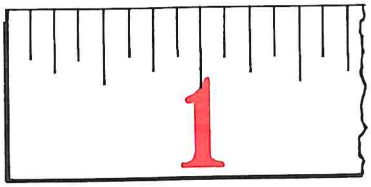
E.



Giving Answers in Two Ways

Jack said he found that his ruler was helpful in learning about equal fractions.

Use this picture and see if you can find equal fractions as Jack did.



1. $\frac{1}{4}$ in. + $\frac{1}{4}$ in. = $\frac{?}{4}$ in. or $\frac{?}{?}$ in.
2. $\frac{1}{8}$ in. + $\frac{3}{8}$ in. = $\frac{?}{8}$ in. or $\frac{?}{?}$ in.
3. $\frac{2}{8}$ in. + $\frac{2}{8}$ in. = $\frac{?}{8}$ in. or $\frac{?}{?}$ in.
4. $\frac{5}{8}$ in. + $\frac{1}{8}$ in. = $\frac{?}{8}$ in. or $\frac{?}{?}$ in.
5. $\frac{3}{8}$ in. + $\frac{3}{8}$ in. = $\frac{?}{8}$ in. or $\frac{?}{?}$ in.

6. Use your ruler. Find the exact length of each line given below.

7. If lines A and F were put together, how long would the new line be?

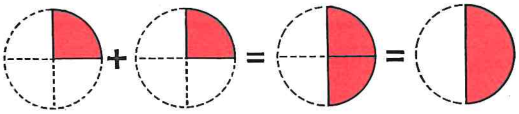
8. If lines A and E were put together, how long would the new line be?

9. If lines B and C were put together, how long would the new line be?

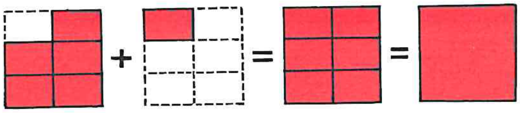
10. Ann said, "If lines B and E were put together, the new line would be $\frac{1}{4}$ in. + $\frac{3}{4}$ in. The new line would be 1 inch long." How can Ann tell this without drawing and measuring the new line?

11. How long is line A? Line G? If these lines were drawn together, would the new line measure 1 in.? How can you tell?

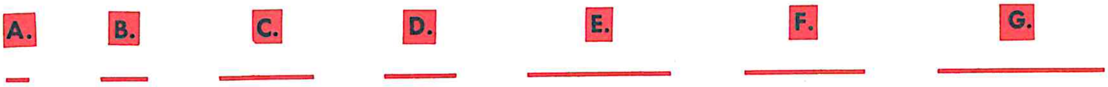
For these pictures, write the answers in two ways.

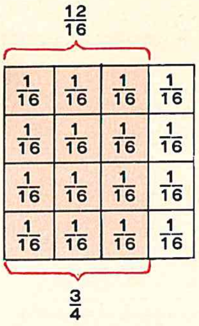


12. $\frac{?}{?} + \frac{?}{?} = \frac{?}{?} = \frac{?}{?}$



13. $\frac{?}{?} + \frac{?}{?} = \frac{?}{?} = \frac{?}{?}$




$\frac{12}{16}$
$\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$
$\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$
$\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$
$\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$
$\frac{3}{4}$

Writing Fractions in Simplest Form

1. Look at the picture above. What two fractions tell the part of the large square that is in color?

2. How do you know that $\frac{12}{16}$ and $\frac{3}{4}$ are equal fractions?

3. Which fraction is in simplest form, $\frac{12}{16}$ or $\frac{3}{4}$?

4. Which would you ask for, $\frac{2}{4}$ yd. of ribbon or $\frac{1}{2}$ yd.?

5. Which would you ask for, $\frac{1}{2}$ doz. eggs or $\frac{6}{12}$ doz.?

6. Which do you say, $\frac{5}{10}$ dollar or $\frac{1}{2}$ dollar?

7. Would your grocer say that a piece of cheese weighed $\frac{6}{8}$ lb. or $\frac{3}{4}$ lb.?

8. Jack said he noticed that the fraction with the simplest form always had smaller terms than the other equal fraction. Use these fractions and tell what Jack meant.

$\frac{2}{4}=\frac{1}{2}$　　$\frac{6}{12}=\frac{1}{2}$　　$\frac{4}{8}=\frac{1}{2}$

$\frac{2}{8}=\frac{1}{4}$　　$\frac{4}{16}=\frac{1}{4}$　　$\frac{3}{12}=\frac{1}{4}$

Ann said it is easier to think of the meaning of a fraction that has small terms than it is to think of the meaning of a fraction that has large terms.

Answer question 9 and then tell if Ann is right.

9. Which do you understand more easily? Why?

$\frac{4}{16}$ lb. of butter or $\frac{1}{4}$ lb. of butter

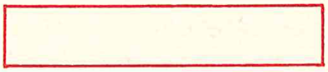
$\frac{9}{12}$ hr. or $\frac{3}{4}$ hr.

$\frac{6}{8}$ of your book or $\frac{3}{4}$ of it

10. When you talk about the terms of a fraction, what do you mean?

11. Ann said, "The smaller the terms of a fraction are, the larger the equal parts will be."

Make three drawings of the same size, like the one below.



Color $\frac{4}{12}$ of one drawing, $\frac{2}{6}$ of another, and $\frac{1}{3}$ of the last one.

As the numerator and denominator of the equal fractions get smaller, what happens to the size of the equal parts? To the number of equal parts?

Just to Remind You

Here are some things you use often as you work with fractions.

1. The number below the line in a fraction tells how many equal parts there are. It is called the ? of the fraction.

2. The number above the line in a fraction tells how many of the equal parts we are talking about. It is called the ? of the fraction.

3. The terms of a fraction are the ? and the ?.

4. Use figures. Write these fractions: eight twelfths; seven ninths.

In these statements the fraction telling the amount is not in simplest form. What fraction would you use?

5. Tom had traveled $\frac{2}{4}$ of his journey.

6. My little brother is $\frac{4}{6}$ as old as I.

7. Mother used $\frac{8}{16}$ of a pound of butter when she baked the cake.

8. Tom gave $\frac{6}{8}$ of his marbles to Bill.

No Pencils, Please!

For each problem give the number question that you would answer before you answer the question asked by the problem.

1. Bob bought 4 key rings at 5¢ each. How much change will he get from 25¢?

2. Betty made these scores in 4 dart games: 3 points, 0 points, 6 points, and 7 points. What was her average number of points for the four games?

3. Tom earned $.75. Bob worked 4 hr. and earned 20¢ an hour. Tom earned how much less than Bob earned?

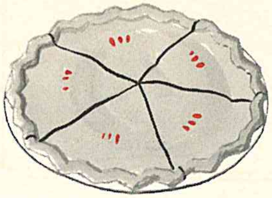
4. At 2 for 5¢, what will you pay for 12 marbles?

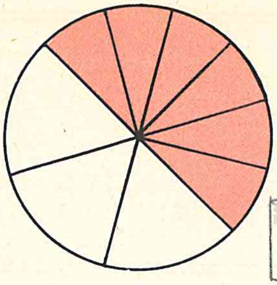
5. Jack worked from 9 A.M. to 2 P.M. How many hours did he work?

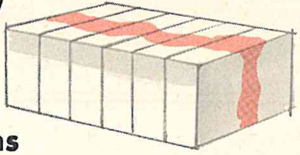
6. Sue bought 5 yards of ribbon at 10¢ a yard and 15¢ worth of thread. How much did she spend?

7. Jim bought 2 candied apples at 15¢ each and a 25¢ package of paper napkins. How much did he pay for these things?

8. Mrs. Smith had 15 yards of material. From it she made 4 curtains, using 3 yd. for each curtain. How many yards did she have left?







Answering Questions About Fractions

1. Which picture above shows that $\frac{5}{5}$ equal 1 whole?

2. The white part of the circle shown above is $\frac{1}{2}$ or $\frac{?}{6}$ of the circle. The colored part of this circle is $\frac{1}{2}$ or $\frac{6}{?}$ of the circle.

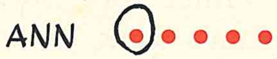
3. Jack's little brother said that $\frac{1}{6}$ of the brick of ice cream was more than $\frac{1}{3}$ of it because the 6 in $\frac{1}{6}$ is a larger number than the 3 in $\frac{1}{3}$. What would you tell Jack's brother?

4. The bar of soap is cut into halves. Write one whole as halves.

5. The candy box above is divided into 8 equal parts. There is a piece of candy in each part. How many pieces of candy are there in the whole?

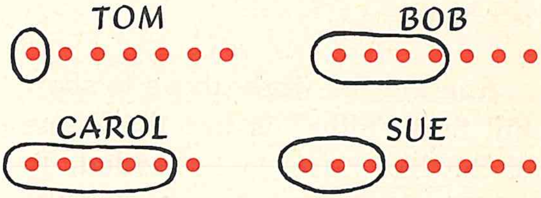
6. One piece of the candy is $\frac{1}{8}$ of the whole. What part of the whole is 4 pieces? Two pieces?

7. Ann drew 5 dots. She put a ring around 1 dot. Look at Ann's work. What part of the dots were in the ring?



8. If Ann had 2 of the 5 dots in the ring, what part of the dots would be in the ring? What part of the 5 dots would not be in the ring?

9. For each picture give a fraction that will tell what part of the dots are in the ring.



10. Nancy said that $\frac{5}{5}$ of a pie was less than $\frac{10}{10}$ of it. What would you tell Nancy to help her?

11. Which of these fractions are not **like** fractions? How can you tell? $\frac{2}{3}$ $\frac{2}{6}$ $\frac{2}{9}$ $\frac{1}{3}$

■ **Fractions that mean less than 1 whole are called proper fractions.**

12. Which of these are not proper fractions? How can you tell?

$\frac{3}{8}$ $\frac{5}{6}$ $\frac{4}{4}$ $\frac{2}{2}$ $\frac{2}{3}$ $\frac{8}{8}$

ANN	1 apple	1 fifth	$\frac{1}{5}$
	+2 apples	+2 fifths	$+\frac{2}{5}$
	3 apples	3 fifths	$\frac{3}{5}$

Adding and Subtracting Like Fractions

Ann said, "I don't have any trouble when I add fractions. I just make sure that the denominators are the same. Then I add the numerators."

1. Bill wanted to know why Ann did not get a different denominator when she added. What would you tell him?

Ann did the work above to show Bill that "fifths" is just the name of the like parts to be added. In adding $\frac{1}{5}+\frac{2}{5}$, you do not add the name "fifths" any more than you add the name "apples" when you add 1 apple and 2 apples.

2. Say the sums for the work below. Give the name of the things you added.

5 oranges	5 ninths	$\frac{5}{9}$
+2 oranges	+2 ninths	$+\frac{2}{9}$

3. What part of the fractions did you add when you added $\frac{5}{9}$ and $\frac{2}{9}$? What part of the fraction stayed the same?

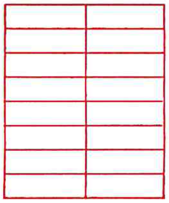
■ **To add like fractions, add the numerators. The denominator does not change.**

▶ Copy. Find the sums.

4.
$$\begin{array}{rrrrr} \frac{3}{16} & \frac{5}{16} & \frac{9}{12} & \frac{10}{12} & \frac{4}{10} \\ \underline{+\frac{8}{16}} & \underline{+\frac{4}{16}} & \underline{+\frac{2}{12}} & \underline{+\frac{1}{12}} & \underline{+\frac{5}{10}} \end{array}$$

5.
$$\begin{array}{rrrrrr} \frac{1}{8} & \frac{2}{5} & \frac{3}{8} & \frac{2}{9} & \frac{3}{7} & \frac{4}{16} \\ \frac{1}{8} & \frac{1}{5} & \frac{2}{8} & \frac{3}{9} & \frac{1}{7} & \frac{5}{16} \\ \underline{+\frac{1}{8}} & \underline{+\frac{1}{5}} & \underline{+\frac{2}{8}} & \underline{+\frac{2}{9}} & \underline{+\frac{2}{7}} & \underline{+\frac{2}{16}} \end{array}$$

6. Draw a picture to show that you added $\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$ correctly.



7. Draw a picture like the one at the right. Show that you found the correct sum of $\frac{4}{16}+\frac{5}{16}+\frac{2}{16}$.

After Bill studied Ann's work, he said,

	5 apples	5 eighths	$\frac{5}{8}$
BILL	−2 apples	−2 eighths	$-\frac{2}{8}$
	3 apples	3 eighths	$\frac{3}{8}$

"I think I know how to subtract like fractions, too."

8. Study the work Bill put on the chalkboard. Make up a rule for subtracting like fractions.

Copy. Find the differences.

9. 3 fourths − 2 fourths 2 thirds − 1 third

$$\begin{array}{r}\text{3 fourths}\\ -\text{2 fourths}\\ \hline\end{array}\qquad\begin{array}{r}\text{2 thirds}\\ -\text{1 third}\\ \hline\end{array}$$

10.

$$\begin{array}{r}\text{6 eighths}\\ -\text{5 eighths}\\ \hline\end{array}\qquad\begin{array}{r}\text{7 ninths}\\ -\text{2 ninths}\\ \hline\end{array}$$

11. Write the subtraction examples in rows 9 and 10 using figures only.

▶ Copy. Find the differences.

12.

$$\begin{array}{r}\frac{4}{5}\\ -\frac{3}{5}\\ \hline\end{array}\quad\begin{array}{r}\frac{5}{6}\\ -\frac{4}{6}\\ \hline\end{array}\quad\begin{array}{r}\frac{4}{5}\\ -\frac{2}{5}\\ \hline\end{array}\quad\begin{array}{r}\frac{8}{9}\\ -\frac{5}{9}\\ \hline\end{array}\quad\begin{array}{r}\frac{7}{8}\\ -\frac{4}{8}\\ \hline\end{array}\quad\begin{array}{r}\frac{4}{6}\\ -\frac{3}{6}\\ \hline\end{array}$$

13.

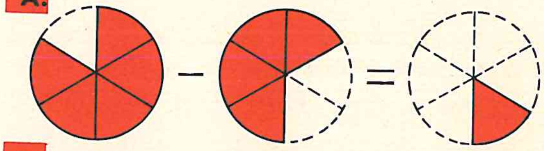
$$\begin{array}{r}\frac{11}{16}\\ -\frac{6}{16}\\ \hline\end{array}\quad\begin{array}{r}\frac{7}{9}\\ -\frac{2}{9}\\ \hline\end{array}\quad\begin{array}{r}\frac{11}{12}\\ -\frac{4}{12}\\ \hline\end{array}\quad\begin{array}{r}\frac{7}{16}\\ -\frac{2}{16}\\ \hline\end{array}\quad\begin{array}{r}\frac{6}{7}\\ -\frac{2}{7}\\ \hline\end{array}\quad\begin{array}{r}\frac{3}{4}\\ -\frac{2}{4}\\ \hline\end{array}$$

14.

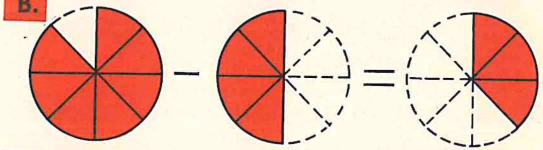
$$\begin{array}{r}\frac{6}{8}\\ -\frac{5}{8}\\ \hline\end{array}\quad\begin{array}{r}\frac{9}{10}\\ -\frac{6}{10}\\ \hline\end{array}\quad\begin{array}{r}\frac{5}{12}\\ -\frac{4}{12}\\ \hline\end{array}\quad\begin{array}{r}\frac{8}{15}\\ -\frac{4}{15}\\ \hline\end{array}\quad\begin{array}{r}\frac{7}{12}\\ -\frac{2}{12}\\ \hline\end{array}\quad\begin{array}{r}\frac{3}{6}\\ -\frac{2}{6}\\ \hline\end{array}$$

15. Find the subtraction in rows 12 and 13 that each picture below shows.

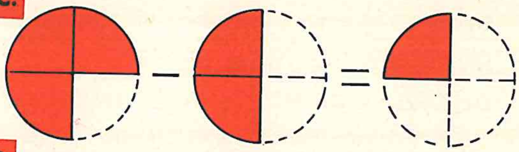
A.



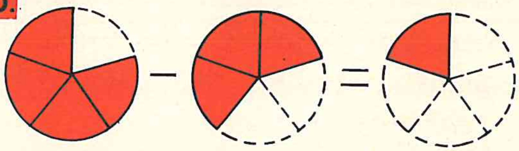
B.

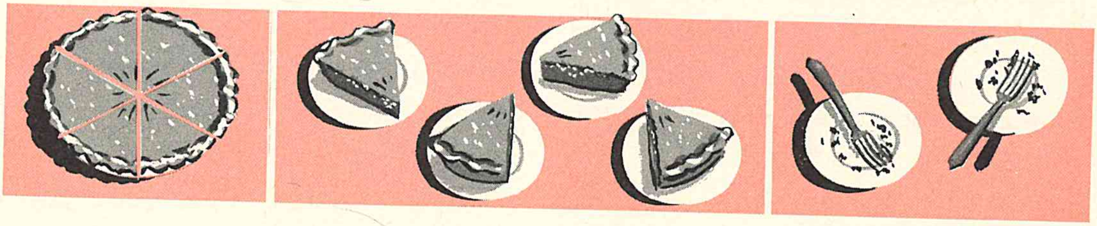


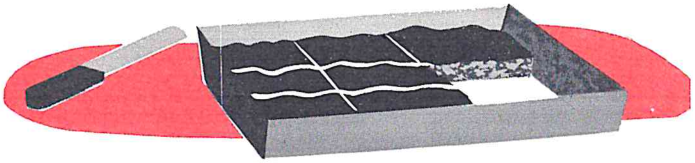
C.



D.







Problems with Fractions

1. Sue put $\frac{1}{4}$ cup of sugar into a cup and added $\frac{2}{4}$ cup of flour. How much was now in the measuring cup in which she mixed these amounts?

2. Jack rode his bicycle $\frac{7}{8}$ mi. Don rode his bicycle $\frac{2}{8}$ mi. How much farther did Jack ride?

3. Gary noticed that the gasoline tank was $\frac{3}{4}$ full when his father drove away. The tank was $\frac{2}{4}$ full when his father returned. What part of a tank of gasoline had his father used?

4. Mary cut $\frac{1}{6}$ yd. from a piece of ribbon that was $\frac{5}{6}$ yd. long. What was the length of the piece of ribbon that was left?

5. Monday and Tuesday are $\frac{2}{7}$ of a week. Wednesday, Thursday, and Friday are $\frac{3}{7}$ of a week. Together the five days are what part of a week?

6. Tom had $\frac{7}{8}$ of a watermelon to sell. He sold two pieces that equaled $\frac{2}{8}$ of the melon. What part of the melon did he then have left to sell?

7. Betty put $\frac{7}{9}$ of a cake on a plate. Some children ate 5 of the 7 pieces. What part of Betty's cake did they leave on the plate?

Copy. Find the answers.

8. $$\begin{array}{r}\text{3 sixths}\\ -\text{2 sixths}\\ \hline\end{array}\qquad\qquad\begin{array}{r}\text{5 ninths}\\ -\text{3 ninths}\\ \hline\end{array}$$

9. $$\begin{array}{r}\text{2 sixths}\\ \text{1 sixth}\\ +\text{2 sixths}\\ \hline\end{array}\qquad\qquad\begin{array}{r}\text{2 fifths}\\ \text{1 fifth}\\ +\text{1 fifth}\\ \hline\end{array}$$

10. $$\begin{array}{r}\text{3 ninths}\\ \text{2 ninths}\\ +\text{2 ninths}\\ \hline\end{array}\qquad\qquad\begin{array}{r}\text{2 eighths}\\ \text{3 eighths}\\ +\text{2 eighths}\\ \hline\end{array}$$

11. Write the examples in rows 8-10 using figures only.

Copy. Find the differences.

12. $$\begin{array}{r}\frac{5}{9}\\ -\frac{3}{9}\\ \hline\end{array}\qquad\begin{array}{r}\frac{2}{5}\\ -\frac{1}{5}\\ \hline\end{array}\qquad\begin{array}{r}\frac{9}{12}\\ -\frac{2}{12}\\ \hline\end{array}\qquad\begin{array}{r}\frac{4}{8}\\ -\frac{1}{8}\\ \hline\end{array}\qquad\begin{array}{r}\frac{6}{9}\\ -\frac{5}{9}\\ \hline\end{array}\qquad\begin{array}{r}\frac{2}{4}\\ -\frac{1}{4}\\ \hline\end{array}$$

13. Write the examples in row 12, using figures and words, as, "5 ninths."

14. Write these fractions in simplest form. Draw pictures if you need help.

$$\frac{2}{8}\qquad\frac{3}{6}\qquad\frac{4}{8}\qquad\frac{2}{4}$$

SANDWICHES	
HAM	15¢
TOMATO	9¢
EGG	6¢
PLATE LUNCH	25¢
SOUP	5¢
DRINKS	
MILK	6¢
ORANGEADE	5¢
DESSERTS	
ICE CREAM	8¢
PUDDING	9¢
CAKE	6¢
FRUIT	
APPLE	5¢
BANANA	4¢
ORANGE	6¢

No Pencils, Please!

Children would look odd in the school lunchroom if they used pencils to find the cost of their lunches.

Can you find the cost of lunches quickly without a pencil? Try it.

1. Ann bought soup, an egg sandwich, and an apple. What did her lunch cost?

2. Don has only 25¢. Will he be able to buy a ham sandwich, milk, and pudding?

3. What would you buy if you had exactly 25¢ to spend?

4. What would you buy if you had only 2 dimes?

5. Bill has a quarter. He bought a tomato sandwich, ice cream, and a piece of cake. What change will he get back?

6. What would you buy if you had 26¢ to spend?

Find the cost of these lunches.

7. A plate lunch, milk, and an apple.

8. An egg sandwich, 2 bananas, and milk.

9. A ham sandwich and 2 oranges.

10. Two egg sandwiches, soup, and a banana.

11. Tomato sandwich, an egg sandwich, and 2 orangeades.

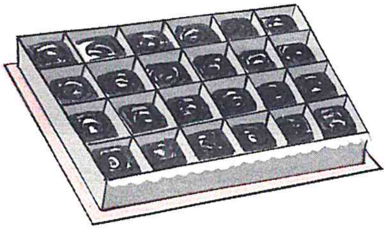
12. Two tomato sandwiches, cake, and an apple.

13. Sue had a quarter and a nickel. She got 4¢ in change. How much did she spend for her lunch?

14. Betty bought soup, ice cream, and a piece of cake. She got 6¢ in change. How much money did she give the cashier?

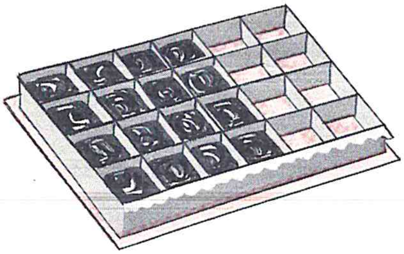
Finding One of the Equal Parts of a Number

Carol got a box of candy from her mother. The minute she opened the box she said, "This box has 24 pieces of candy in it."



1. How do you think Carol knew the number of pieces without counting each piece?

Carol and her mother ate some of the candy. The box then looked like this.



2. Carol said, "We ate $\frac{1}{3}$ of the candy." Find $\frac{1}{3}$ of 24 pieces, and see if Carol is right.

Which of the dot pictures at the bottom of the page helps you to find these amounts?

3. $\frac{1}{8}$ of 24 $\frac{1}{3}$ of 24

4. $\frac{1}{6}$ of 24 $\frac{1}{2}$ of 24

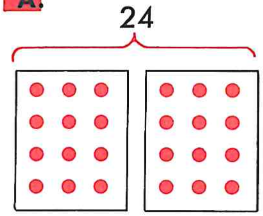
Carol said she noticed that you find how many in one of the equal parts of a number by dividing by the number of equal parts.

5. Is Carol right? To find $\frac{1}{8}$ of 24, were the dots divided into 8 parts? To find $\frac{1}{3}$ of 24, were the dots divided into 3 equal parts?

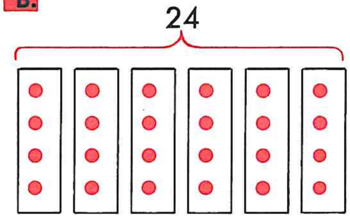
▶ Find the answers.

6. $\frac{1}{4}$ of 24 means $24 \div 4 = \boxed{?}$
7. $\frac{1}{2}$ of 18 means $18 \div 2 = \boxed{?}$
8. $\frac{1}{6}$ of 72 means $72 \div 6 = \boxed{?}$
9. $\frac{1}{9}$ of 27 means $27 \div 9 = \boxed{?}$
10. $\frac{1}{8}$ of $56 = \boxed{?}$ $\frac{1}{4}$ of $96 = \boxed{?}$
11. $\frac{1}{7}$ of $49 = \boxed{?}$ $\frac{1}{5}$ of $75 = \boxed{?}$
12. $\frac{1}{3}$ of $300 = \boxed{?}$
13. $\frac{1}{9}$ of $360 = \boxed{?}$

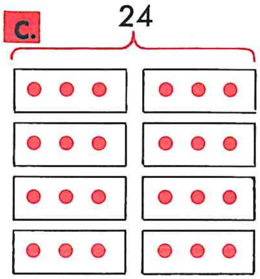
A.



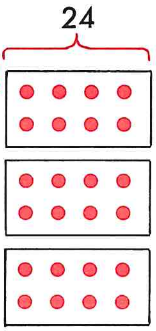
B.



C.



D.



Problem Solving

Remember: There are four kinds of number questions.

- Addition number questions.
- Subtraction number questions.
- Multiplication number questions.
- Division number questions.

Remember: To solve some problems, you need to answer only one number question.

To solve other problems, you may need to answer two, or more, number questions.

Read these problems. Tell which can be solved by answering one number question.

1. Joe said that $\frac{1}{4}$ of 998 was about $200. Was he right?

2. There were 165 ft. of fencing wire in a roll. Bill used 35 ft. of the wire to fence a yard for his dog. How many feet of wire were there left on the large roll?

3. An electric train that Jack, Sue, and Bob want costs $39.75. Jack has saved $14.25. Sue has $9.75, and Bob has $12.60. If they put all their money together, how much more will they need to buy the train?

4. At 4 for 25¢, what must I pay for 16 flashlight batteries?

5. Mrs. West has four children. The children want to buy their mother a toaster costing $14.60. What will be each child's share of the cost?

6. How many three-cent stamps can you buy if you have a half dollar and 4 cents, and you spend all of your money for the stamps?

7. Here are the heights of the boys on a basketball team: Bill, 51 in.; Jerry, 53 in.; Jim, 49 in.; Carl, 54 in.; and Tom, 48 in. What is the average height of the boys on this team?

8. Ann paid $.30 for 6 doughnuts. What did 1 doughnut cost at this price?

9. What will you pay for $\frac{1}{2}$ doz. oranges at $.79 a dozen?

10. Joan saw some dress goods marked at $.98 a yard. Four days later the same goods was marked down to $.89 a yard. How much more did the cloth cost before the price was lowered?

11. Bill made 7 bookshelves out of $14.35 worth of lumber. How much did the lumber for each shelf cost?

Problem Solving

Read these problems. Tell which problems ask two number questions.

1. Mrs. Brown bought a dress costing $8.50 and a $4.00 pair of gloves. Mrs. Dee bought a dress costing $14.95. Mrs. Dee spent how much more than Mrs. Brown?

2. Mr. Brown earns $375 a month. How much does he earn in 1 year?

3. A farmer bought 5 bags of chicken feed at $6.05 a bag. How much did he have left from two $20 bills?

4. How much will I pay for 2 pounds of apples at 2 lb. for 39¢ and a half pound of bacon at $.50 a pound?

5. Bill had $10.00 in his savings bank. He used some of this money to buy 7 savings stamps at $.25 each. How much did he have left in the bank?

6. Eight boys are going on an outing for 6 days. They figure the cost per day will be $14.72. What will be each boy's share of the expense for the whole outing?

7. Jack and his father began a 750-mi. trip. After they had gone 125 mi., how many miles did they have left to travel?

8. At 3 bars for 25¢, what will you pay for 12 bars of soap?

9. Joe had 14 rabbits in one pen and 11 rabbits in another pen. How many rabbits did he have left if he sold 17 of these rabbits?

10. Gary took 108 green onions from his garden. He put them in bunches of 9 onions each. How much did he get for the onions if he sold them at $.09 a bunch?

11. Bob had $4.60 in his savings bank. He then saved $.45 a week for 9 weeks and put this also in his savings bank. How much money did he have all together?

12. If 84 children are going to dance in groups of 4 children each, how many groups of dancers will there be?

13. Bill has 152 stamps to paste in his stamp book. After he has pasted 9 rows of 10 stamps each, how many stamps will he have left to put in his book?

14. Jane had 2 dozen eggs. She used 4 eggs to bake a cake. How many eggs were left?

15. Betty earned $.75 helping her mother. She spent $.25 for candy and $.10 for pencils. How much did she have left?

Are These True Statements?

Read each statement and decide whether or not it is true. Give a reason or make a drawing to show that you have answered correctly.

1. The denominator of a fraction gives the name to the fraction. If the denominator is 5, the name of the fraction is "fifths."

2. A piece of ribbon $\frac{1}{8}$ yd. long is longer than a piece that is $\frac{5}{8}$ yd. long.

3. One half of one pie may not be equal to $\frac{1}{2}$ of another pie.

4. The numerator of a fraction tells how many of the equal parts of the whole we are talking about.

5. The 9 in 925 has the largest value of all the figures used in writing the numbers at the right.

2 5 9
9 2 5
5 9 2

6. You can find how many 2's equal 14 either by subtracting 2's or by dividing by 2.

7. If the numbers you are adding are all alike, you can usually get your answer faster by multiplying.

8. The average of 6, 5, and 4 is 5.

9. When $\frac{6}{6}$ of a cake have been eaten, the whole cake is eaten.

10. At 3 for 10¢, 9 apples will cost 30¢.

11. To find $\frac{1}{3}$ of a number, divide the number by 3.

12. Like fractions all have the same denominator.

13. Proper fractions always mean less than a whole.

Testing Your Addition

▶ Write answers on folded paper.

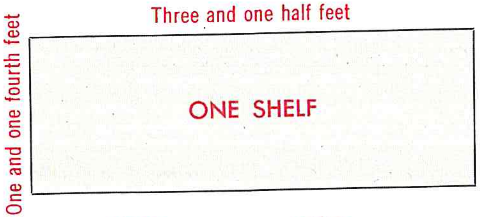
1.	4	7	2	9	3	8¢
	2	5	3	8	7	6¢
	+9	+4	+8	+3	+9	+5¢

2.	7	9	7	5	3	6¢
	0	2	4	1	9	8¢
	6	3	8	9	2	5¢
	+9	+5	+4	+8	+6	+9¢

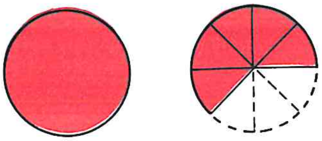
3.	5	8	0	25	14	$.59
	2	4	6	18	9	.12
	7	9	8	4	2	.06
	8	5	9	16	57	.03
	+4	+0	+7	+5	+3	+.29

4.	194	746	604	$9.72
	215	406	872	1.36
	386	190	573	4.15
	+532	+963	+194	+3.05

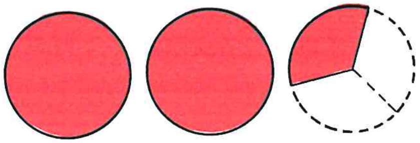
5.	$\frac{5}{12}$	$\frac{1}{16}$			
	$\frac{3}{12}$	$\frac{3}{16}$	$\frac{3}{7}$	$\frac{5}{9}$	$\frac{7}{10}$
	$+\frac{3}{12}$	$+\frac{5}{16}$	$+\frac{3}{7}$	$+\frac{3}{9}$	$+\frac{2}{10}$



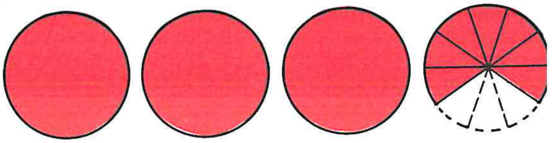
A.



B.



C.



Using Mixed Numbers

Gary made a drawing to show Tom how to cut some shelves.

1. How wide was the shelf to be cut? How long?

Gary said, "My drawing would look better if I could write the length and the width in figures."

Tom said, "You can use figures. You can write one and one fourth feet as $1\frac{1}{4}$ ft. Then you can write three and one half feet as $3\frac{1}{2}$ ft."

Gary said, "I didn't know you could mix whole numbers and fractions in writing amounts."

Tom said, "Of course you can. In fact, they are even called mixed numbers."

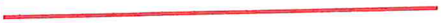
2. Which of these numbers are mixed numbers? How can you tell?

$6 \qquad 7\frac{5}{8} \qquad \frac{4}{9} \qquad 2\frac{3}{5} \qquad 1\frac{9}{10}$

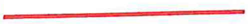
3. Look at pictures A, B, and C. Write a mixed number that will tell how many wholes and how many parts of the circles are colored.

4. Use your ruler. Measure exactly, and then write the mixed number that tells how long each line is.

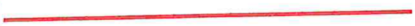
D.



E.



F.



5. Write the mixed number that tells how long a page of your arithmetic book is.

6. How many inches wide is the cover of your arithmetic book?

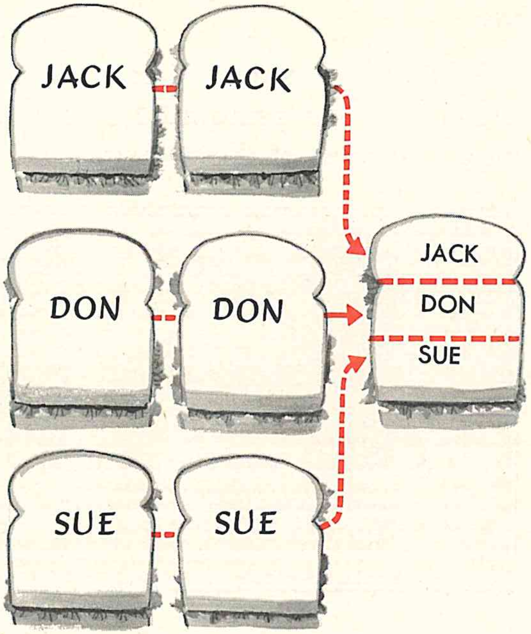
7. Jerry says that the number of inches in the length of the cover of your arithmetic book is not a mixed number. Is he right? Think of the definition below.

■ **A number that is made up of a whole number and a fraction is called a mixed number.**

Quotients That Are Mixed Numbers

Jack, Don, and Sue wanted to divide 7 sandwiches so that each would get an equal share.

1. Jack said, "You can find equal shares from this picture." Explain how to use the picture.



Don said, "You can give each child 2 sandwiches. Then you can cut the left-over sandwich into three equal parts. Each child will get 2 sandwiches and 1 of the equal parts."

2. Write a mixed number that will mean 2 wholes and one of the three equal parts.

Sue said, "I can see from Jack's picture that you can find an equal share by dividing 7 by 3. The first number in the quotient will be 2. The second number will be $\frac{1}{3}$, because 1, the remainder, will be divided into three equal parts or $\frac{3}{3}$. One of these thirds ($\frac{1}{3}$) will be in each of the equal shares. The quotient shows one of these equal shares."

SUE

$$\begin{array}{r} 2\frac{1}{3} \\ 3\overline{)7} \\ \underline{6} \\ 1 \end{array}$$

3. Draw a picture to show 10 cookies divided equally among 3 children. Write the mixed number that shows each child's share.

4. Draw a picture to show 9 pieces of chalk divided equally among 4 children. Write the mixed number that shows each child's share.

▶ Copy. Find the answers. Divide the left-over part and write a fraction as part of each quotient.

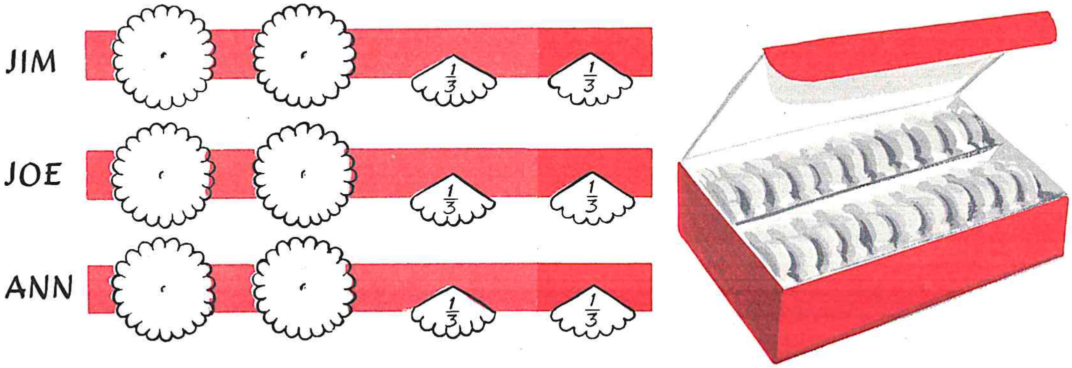
5. $2\overline{)15}$ $3\overline{)13}$ $5\overline{)11}$

6. $5\overline{)21}$ $4\overline{)17}$ $6\overline{)25}$

7. $2\overline{)11}$ $5\overline{)16}$ $4\overline{)29}$

8. $2\overline{)13}$ $4\overline{)21}$ $7\overline{)22}$

9. $3\overline{)28}$ $6\overline{)19}$ $9\overline{)37}$



Sharing a Remainder of More Than One

Jim, Joe, and Ann shared some cookies. Look at the picture above.

1. How many cookies did each of the 3 children get?

2. How many cookies did the 3 children have to divide in the beginning?

3. Write a division number question about dividing the cookies.

4. Do the division example and find the answer to your division question.

5. If you did exercises 3 and 4 correctly, your quotient is $2\frac{2}{3}$. Why is $\frac{2}{3}$ part of your quotient?

6. Draw a picture to show 11 doughnuts divided equally among 4 children. Write the mixed number that tells what was each child's share of the doughnuts.

7. Write a division example and its quotient that will show how the doughnuts in exercise 6 were shared.

8. Tell, or draw a picture to show, how the remainder was divided in each of these examples.

A.

$$\begin{array}{r} 6\frac{2}{3} \\ 3\overline{)20} \\ \underline{18} \\ 2 \end{array} \qquad \begin{array}{r} 3\frac{3}{4} \\ 4\overline{)15} \\ \underline{12} \\ 3 \end{array} \qquad \begin{array}{r} 2\frac{5}{6} \\ 6\overline{)17} \\ \underline{12} \\ 5 \end{array}$$

B.

$$\begin{array}{r} 3\frac{2}{5} \\ 5\overline{)17} \\ \underline{15} \\ 2 \end{array} \qquad \begin{array}{r} 3\frac{5}{8} \\ 8\overline{)29} \\ \underline{24} \\ 5 \end{array} \qquad \begin{array}{r} 2\frac{6}{7} \\ 7\overline{)20} \\ \underline{14} \\ 6 \end{array}$$

▶ Copy. Find the quotients. Be sure you divide the remainder.

9. $4\overline{)23}$ $\quad 5\overline{)24}$ $\quad 3\overline{)17}$

10. $8\overline{)35}$ $\quad 7\overline{)30}$ $\quad 9\overline{)38}$

11. $3\overline{)38}$ $\quad 4\overline{)67}$ $\quad 9\overline{)85}$

12. $6\overline{)35}$ $\quad 4\overline{)29}$ $\quad 5\overline{)69}$

13. $7\overline{)15}$ $\quad 6\overline{)29}$ $\quad 5\overline{)47}$

Questions About Remainders in Division

1. If you were dividing 29 boys into teams of 8 boys each, would you use division A or B? Explain why you would use this division rather than the other one.

A. $$\begin{array}{r} 3\frac{5}{8} \\ 8\overline{)29} \\ \underline{24} \\ 5 \end{array}$$

B. $$\begin{array}{r} 3,\ \text{r } 5 \\ 8\overline{)29} \\ \underline{24} \\ 5 \end{array}$$

2. There are places for exactly 8 children at each table. If you were seating 29 children, which would you do?

a. Get $3\frac{5}{8}$ tables.

b. Leave 5 children standing.

c. Get 4 tables.

3. If you were dividing 24 cookies equally among 5 children, would you use division A or B? Give a reason for your choice.

A. $$\begin{array}{r} 4\frac{4}{5} \\ 5\overline{)24} \\ \underline{20} \\ 4 \end{array}$$

B. $$\begin{array}{r} 4,\ \text{r } 4 \\ 5\overline{)24} \\ \underline{20} \\ 4 \end{array}$$

4. Five children want to divide 24 pennies equally among themselves. Which will they have to do?

a. Each get $4\frac{4}{5}$ pennies.

b. Each get 5 pennies.

c. Have 4 pennies they cannot divide.

5. Jack had 14 rabbits. He wanted to divide the rabbits equally among 3 boys. Look at Jack's work below.

JACK $$\begin{array}{r} 4,\ \text{r } 2 \\ 3\overline{)14} \\ \underline{12} \\ 2 \end{array}$$

Why did Jack leave 2 as a remainder when he divided the rabbits into equal groups?

Subtraction Practice

▶ Copy. Find the differences.

1. $\begin{array}{r}545\\-28\\\hline\end{array}$ $\quad\begin{array}{r}635\\-97\\\hline\end{array}$ $\quad\begin{array}{r}436\\-379\\\hline\end{array}$ $\quad\begin{array}{r}541\\-469\\\hline\end{array}$

2. $\begin{array}{r}98¢\\-28¢\\\hline\end{array}$ $\quad\begin{array}{r}56¢\\-50¢\\\hline\end{array}$ $\quad\begin{array}{r}79¢\\-45¢\\\hline\end{array}$ $\quad\begin{array}{r}82¢\\-79¢\\\hline\end{array}$

3. $\begin{array}{r}\$4.15\\-.69\\\hline\end{array}$ $\quad\begin{array}{r}\$9.00\\-2.35\\\hline\end{array}$ $\quad\begin{array}{r}\$4.99\\-4.90\\\hline\end{array}$ $\quad\begin{array}{r}\$1.29\\-.05\\\hline\end{array}$

4. $\begin{array}{r}\frac{7}{8}\\-\frac{4}{8}\\\hline\end{array}$ $\quad\begin{array}{r}\frac{11}{12}\\-\frac{4}{12}\\\hline\end{array}$ $\quad\begin{array}{r}\frac{13}{16}\\-\frac{6}{16}\\\hline\end{array}$ $\quad\begin{array}{r}\frac{7}{10}\\-\frac{4}{10}\\\hline\end{array}$ $\quad\begin{array}{r}\frac{5}{7}\\-\frac{2}{7}\\\hline\end{array}$ $\quad\begin{array}{r}\frac{7}{9}\\-\frac{3}{9}\\\hline\end{array}$

No Pencils, Please!

1. Each piece of ribbon is 10 in. long. What is the length of 10 such pieces of ribbon?

2. Each boy has 10 pieces of candy. How many pieces do 5 boys have? 7 boys?

3. How many cents equal 1 dime? Equal 4 dimes? Equal 9 dimes?

4. There are 100 soda straws in each package. How many straws are there in 5 packages? In 7 packages?

5. Bill planted 8 rows of cabbage plants. There were 10 plants in each row. How many plants were there in all?

6. There are 10 postage stamps in a row and 10 rows on a sheet of stamps. How many stamps are there in one full sheet?

7. The girls ran a race in 8 min. The boys ran the race in $\frac{1}{2}$ the time the girls took. How long did the boys take?

8. There are 48 paper napkins in a full package. How many napkins will there be in $\frac{1}{4}$ package? In $\frac{1}{6}$ package?

9. At 60¢ a pound, what will $\frac{1}{2}$ pound of butter cost?

10. Jack and his family are making a trip of 96 miles from Jack's house to his uncle's. How many miles have they traveled when Jack's father says they have driven one half of the way?

11. At 2 lb. for 25¢, what will 4 lb. of green beans cost?

12. At 3 bars for 10¢, what will 9 bars of soap cost?

Mixed Practice

▶ Copy. The signs tell you what to do.

1. $\begin{array}{r}835\\ \times 8\\ \hline\end{array}$ $\quad$ $\begin{array}{r}856\\ \times 7\\ \hline\end{array}$ $\quad$ $\begin{array}{r}4096\\ +1948\\ \hline\end{array}$

2. $\begin{array}{r}\$9.09\\ -2.47\\ \hline\end{array}$ $\quad$ $\begin{array}{r}4279\\ -586\\ \hline\end{array}$ $\quad$ $\begin{array}{r}635\\ -256\\ \hline\end{array}$

3. $\begin{array}{r}\$8.79\\ +1.72\\ \hline\end{array}$ $\quad$ $\begin{array}{r}890\\ +604\\ \hline\end{array}$ $\quad$ $\begin{array}{r}8270\\ -8159\\ \hline\end{array}$

4. $\$4.25+\$.07+\$3.20+\$.04$

5. $8\overline{)768}$ $\quad$ $8\overline{)232}$ $\quad$ $7\overline{)504}$

▶ Find the quotients. Divide the remainders.

6. $5\overline{)26}$ $\quad$ $3\overline{)23}$ $\quad$ $8\overline{)45}$ $\quad$ $4\overline{)30}$

7. $3\overline{)17}$ $\quad$ $2\overline{)13}$ $\quad$ $4\overline{)37}$ $\quad$ $5\overline{)36}$

Review of Word Problems

Write a number question for each of these problems.

1. There were 144 pencils in a box. How many pencils were there in 12 such boxes?

2. A box of chalk contained 200 pieces of chalk. How many pieces will be left if 48 pieces are taken from the box?

3. Divide 215 packages of paper equally among 9 classes.

4. There were 115 paint boxes in one case and 65 in another. How many boxes were there in the two cases together?

5. Mary counted 145 sheets of red paper and 89 pieces of green paper. There were how many more sheets of red paper than of green paper?

6. Betty cut 10 yd. of material into 3 pieces of equal length. How long was each piece?

Write the number question that you will answer before you answer the question that the problem asks.

7. Bill had 2 sacks of marbles. There were 30 marbles in each sack. He gave Tom $\frac{1}{4}$ of these marbles. How many marbles did Tom get?

8. Mr. Jones traveled by train from 7 A.M. to 2 P.M. How many hours in all was he on the train?

9. Joan bought 3 yd. of cloth at $1.59 a yard, and a pair of gloves for $2.29. How much did she spend?

10. Tom bought a scarf for $2.98 and a pair of socks for $1.00. What change did he get if he gave the clerk $5.00?

11. Mrs. West bought 3 chickens. They weighed 6 lb., 5 lb., and 7 lb. At $.67 a pound, what did Mrs. West pay for the chickens?

12. Mrs. Brown divided 6 doz. cookies equally among 8 children. How many cookies did each child get?

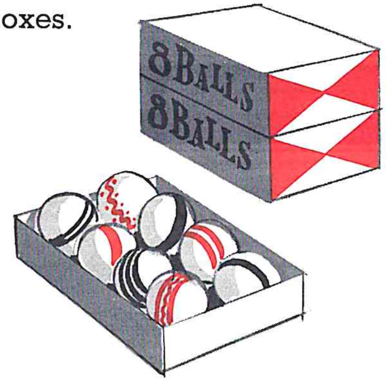
13. Sue had $5.00. She spent $1.25 for meat, $.35 for eggs, and $.50 for fruit. How much money did she have left?

14. Gary's father divided $16 equally among his four children. Gary used $1.98 of his share to buy a bicycle light. How much did Gary have left?

15. Tom earns $2.25 a week. Of this, he spends $1.50 a week. How much can he save in 52 weeks?

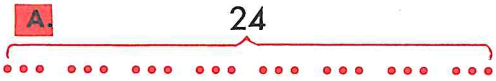
Multiplying the Easier Way

There are 8 rubber balls in one box. The children wanted to find out how many balls there are in 3 boxes.

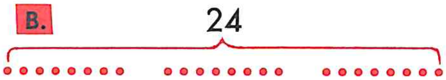


1. Which of the drawings below shows three 8's? What does the other drawing show?

A.



B.



2. How many balls will there be in 72 boxes? Which of the multiplications below shows 72 eights? What does the other multiplication show?

CARL
8
×72
16
56
576

DON
72
×8
576

Don's multiplication does not show 72×8. Why do you think he multiplied the way he did?

3. If you were to find 196×8 lb., which of these ways would you use? Why?

SUE
8 lb.
×196
48
72
8
1568 lb.

ALICE
196
×8
1568 lb.

Alice multiplied by 8 because it is easier to find eight 196's than to find 196 eights. The meaning of the problem told Alice how to name her answer.

4. Mr. Martin sold 32 pairs of shoes at $6 a pair. Explain the easier way that he used to find what he got for all the shoes.

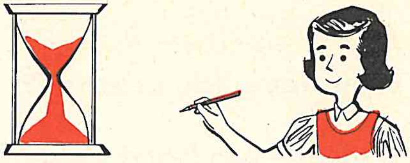
ONE WAY
$6
32
12
18
$192

EASIER WAY
32
6
$192

5. Use the easier way to find the answers.

48×6 yd. 125×$9 239×7 hr.

Measuring Improvement — Test 11



You can check your improvement by taking this test.

The teacher will give the signal to begin and to stop work.

Write the sums on folded paper.

1. $\begin{array}{r}2\\4\\7\\9\\+3\\\hline\end{array}\quad\begin{array}{r}34\\67\\5\\8\\+89\\\hline\end{array}\quad\begin{array}{r}345\\472\\189\\+45\\\hline\end{array}\quad\begin{array}{r}3465\\1900\\+2010\\\hline\end{array}$

Write the differences on folded paper.

2. $\begin{array}{r}354\\-9\\\hline\end{array}\quad\begin{array}{r}84\\-29\\\hline\end{array}\quad\begin{array}{r}1000\\-5\\\hline\end{array}$

3. $\begin{array}{r}3001\\-1076\\\hline\end{array}\quad\begin{array}{r}3654\\-3126\\\hline\end{array}\quad\begin{array}{r}5892\\-4979\\\hline\end{array}$

Copy. Find the products.

4. $\begin{array}{r}38\\\times3\\\hline\end{array}\quad\begin{array}{r}147\\\times5\\\hline\end{array}\quad\begin{array}{r}1259\\\times8\\\hline\end{array}\quad\begin{array}{r}7\\\times325\\\hline\end{array}$

5. $\begin{array}{r}58\\\times39\\\hline\end{array}\quad\begin{array}{r}484\\\times32\\\hline\end{array}\quad\begin{array}{r}798\\\times136\\\hline\end{array}\quad\begin{array}{r}6\\\times938\\\hline\end{array}$

Copy. Find the quotients. Write the remainders as fractions.

6. $8\overline{)63}\quad 6\overline{)359}\quad 5\overline{)1255}$

7. $4\overline{)1608}\quad 7\overline{)1674}\quad 9\overline{)2781}$

Copy. Find the answers.

8. $\frac{1}{8}+\frac{4}{8}=\boxed{?}\quad \frac{2}{7}+\frac{3}{7}=\boxed{?}$

9. $\frac{2}{8}+\frac{1}{8}+\frac{4}{8}=\boxed{?}\quad \frac{2}{9}+\frac{4}{9}+\frac{1}{9}=\boxed{?}$

10. $\frac{3}{7}-\frac{1}{7}=\boxed{?}\quad \frac{5}{6}-\frac{4}{6}=\boxed{?}$

11. $\frac{11}{16}-\frac{6}{16}=\boxed{?}\quad \frac{9}{12}-\frac{4}{12}=\boxed{?}$

Special Helps

Find the two improvement tests on which you made the lowest scores. Study these two test papers. Find out what caused you to make mistakes.

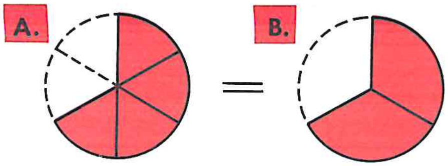
1. If you find you made mistakes because you did not know basic facts well, study pages 321 through page 328. See how rapidly you can write the answers for pages 322, 324, 326, and 328.

2. Find the two tests in which you got your next lowest scores. Do the examples you missed in these tests. Use your index if you need help with certain kinds of examples.

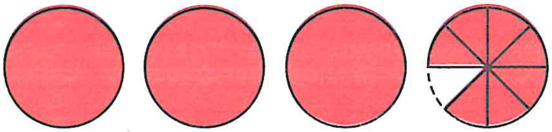
3. Find the two tests in which you got your highest scores. Study any examples you missed in these tests.

How Well Have You Learned?

1. Write the two fractions shown by the colored parts of circles A and B. Which of the fractions is in simplest form?

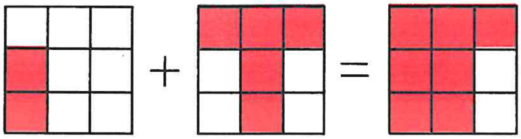


2. Write the mixed number that means the same as the amount that is colored in the drawing below.



3. Write a fraction having 10 as its denominator and 7 as its numerator.

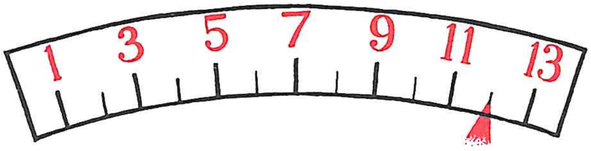
4. Use figures. Write the addition fact that the colored parts of the drawing below show.



5. Use these fractions and write a subtraction fact. $\frac{5}{16}$ $\frac{11}{16}$ $\frac{6}{16}$

6. Which of the following fractions are proper fractions?

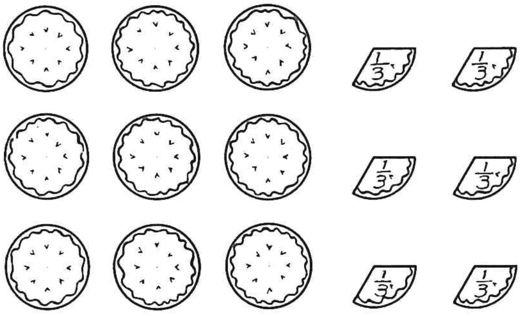
$\frac{3}{8}$ $\frac{2}{9}$ $\frac{12}{12}$ $\frac{1}{2}$



7. Draw 12 dots. Cross out $\frac{1}{3}$ of them.

8. How many minutes are there in $\frac{1}{4}$ hour?

9. The following drawing shows $\boxed{?}$ pies divided into equal shares. How many equal shares are there? Write a mixed number that shows the amount of each share.



Copy. Find the answers. Divide the remainder and write a fraction as part of the quotient.

10. $6\overline{)59}$ $8\overline{)75}$ $5\overline{)64}$ $3\overline{)44}$

11. $4\overline{)531}$ $5\overline{)467}$ $7\overline{)305}$

Copy. Write the left-over parts as remainders.

12. $8\overline{)3593}$ $6\overline{)5621}$ $7\overline{)8923}$

13. Multiply, using the easier way: 546 × 9 lb. 755 × $4.

Helping Yourself

1. To find $\frac{1}{4}$ of 28, you can write $\begin{array}{r}7\\4\overline{)28}\end{array}$. Make a dot picture to show that $\frac{1}{4}$ of 28 is 7. (278)

2. Find $\frac{1}{3}$ of 21. Draw a dot picture to show that you have answered correctly. (278)

3. $\frac{1}{2}$ hr. $= \boxed{?}$ min.

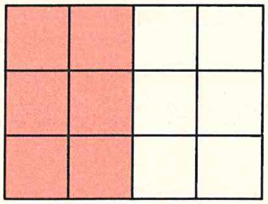
4. $\frac{1}{4}$ hr. $= \boxed{?}$ min.

5. Which of these numbers is a mixed number? Make a drawing to show that the number you choose is made up of wholes and a fraction. (282)

two fifths   four   six and one half

6. Write two fractions that will tell what part of drawing A is colored. Which fraction is in simplest form? (269)

A.



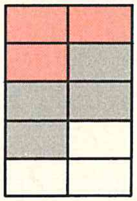
Write each of these fractions in simplest form. Draw a picture if you need help in finding an answer.

7. $\frac{2}{4} = \frac{?}{?}$ $\frac{4}{6} = \frac{?}{?}$ $\frac{6}{8} = \frac{?}{?}$

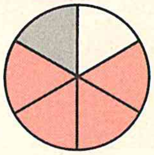
8. $\frac{3}{12} = \frac{?}{?}$ $\frac{6}{12} = \frac{?}{?}$ $\frac{4}{16} = \frac{?}{?}$

9. Write with figures the addition fact you use when you add the colored part and the shaded part of drawing B together. Of drawing C. Of drawing D. (270)

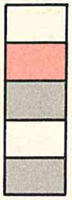
B.



C.



D.



10. If you were dividing a number of boys into teams, would you have a fraction in your quotient? (285)

Copy. Write left-over parts as remainders. Then write the answer as a mixed number. (283-284)

11. $8\overline{)5163}$ $5\overline{)6412}$ $7\overline{)8474}$

Copy. Multiply in two ways. (288)

12. 837×9 536×8 712×6

13. If you were multiplying 8 oz. by 638 and decided to use the easier way, how would you write the example ready to work? (288)

14. If you were dividing 10 sticks of candy among 3 boys, would you have a fraction in your quotient? Explain. (285)

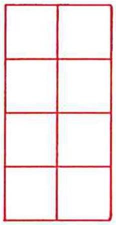
How Well Are You Doing?

1. Make dot drawing to show that you do not change the answer when you multiply 9 by 3 or 3 by 9.

2. Draw 5 cookies divided into 3 equal shares.

3. On a drawing like the one at the right, show $\frac{6}{8}$ in simplest form.

4. On another drawing like this one, show that $\frac{3}{8}+\frac{2}{8}=\frac{?}{8}$.



5. Use the drawing above to find the numbers that belong in place of the question marks.

$\frac{2}{8}=\frac{?}{4}$ $\frac{1}{2}=\frac{?}{8}$ $\frac{3}{4}=\frac{?}{8}$

6. Name the two terms of a fraction.

7. How can you tell without making a drawing that $\frac{1}{2}$ is a larger part than $\frac{1}{16}$?

8. Bill has 12 buttons on his suit coat. He said $\frac{1}{4}$ of the buttons are loose. How many buttons need to be sewed more tightly?

9. Tom mixed $\frac{3}{4}$ cup of lemon juice with 3 cups of water. Write a number that will tell how many cups there were in the mixture.

10. There are 4 qt. in a gallon. How many quart bottles can a dealer fill from a barrel in which there are 150 gal. of vinegar?

11. Mr. West works 8 hr. a day. How many hours will he work in 150 working days?

12. Mrs. Grant divided 11 apples equally among 4 children. What was each child's share?

13. The recipe Ann is using calls for $\frac{1}{4}$ lb. of raisins. Will she have the right amount of raisins if she uses a package marked "4 oz."?

14. If you know the cost of 1 lb. of butter, how can you find the cost of $\frac{1}{2}$ lb.?

15. Sue's mother bought a tablecloth that was $1\frac{1}{3}$ yd. long. How many feet long was the tablecloth?

16. Bob's father parked his car on a parking lot. The sign said, "Parking, 35¢ for $\frac{1}{2}$ hr." His father left the car on the lot 30 minutes. What was his parking charge?

UNIT TWELVE

Things You Need to Know When Shopping

Debbie said, "The soap powder was marked 2 boxes for 39¢. I took only 1 box. How can I pay 19½¢ to the cashier?"

1. Explain how Debbie found that the box of soap powder would cost 19½¢.

$$\begin{array}{r} 19\tfrac{1}{2}¢ \\ 2\overline{)39¢} \\ \underline{2} \\ 19 \\ \underline{18} \\ 1 \end{array}$$

2. Tom said, "Debbie, you can't pay a fraction of a cent." What do you think Tom told her she must do?

3. At 2 for 25¢, what would you pay the grocer for 1 head of lettuce?

4. Ann bought 1 bar of soap. The soap was selling at 3 bars for 25¢. What do you think she paid for the bar she bought?

5. What would you expect to pay for 1 yard of ribbon that was selling at 3 yards for $1.00?

6. What would you pay for ½ lb. of cheese at 79¢ a lb.?

7. What would you pay for ¼ doz. eggs at 35¢ a dozen?

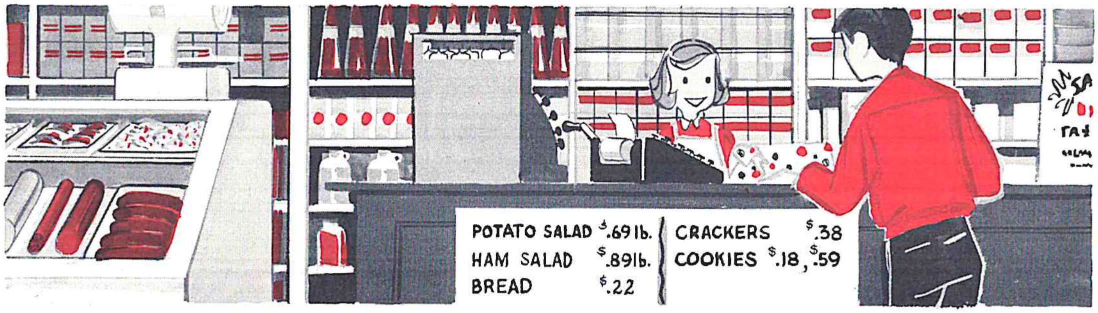
Ann saw a sign that said, "Soup, 10¢ a can, 3 cans for 25¢."

8. At 3 cans for 25¢, what does 1 can of soup cost?

9. Can you think of some reasons why the grocer charges 10¢ for 1 can of soup?

10. Why do you think the grocer sells 3 cans of soup for less than you pay when you buy 3 cans one at a time?

11. If lettuce is selling at 15¢ a head or 4 heads for 50¢, would it always be wise to buy 4 heads because the price per head is cheaper?



Counting Change

Carl and his younger sister Sue are learning to help in the store.

"I can use the adding machine to find how much customers spend," said Sue, "but I will have trouble subtracting when I figure their change."

Carl said, "You do not have to know how to subtract. You really add coins when you make change."

Find the prices in the picture for these problems.

1. A man bought a 22¢ loaf of bread. He gave Sue 50¢. Carl said, "Give him 3 pennies. Then give him 1 coin to make 50¢." What coin did Sue give the man after she gave him 3 pennies?

$$22\text{¢}+1\text{¢}+1\text{¢}+1\text{¢}=25\text{¢}$$
$$25\text{¢}+\boxed{?}=50\text{¢}$$

2. A lady bought a pound of potato salad. She gave Sue a dollar bill. Tell what coins Sue gave her in change.

$$69\text{¢}+1\text{¢}+5\text{¢}+25\text{¢}=100\text{¢} \text{ or } \$1.00$$

Carl said, "A good rule for making change is to use the fewest coins you can."

3. In problem 2 did Sue use the fewest coins she could? What other coins could she have used instead of 25¢? Would that be following Carl's rule?

Use the fewest coins you can and tell what coins you would give in change to these people.

4. A girl bought an 8¢ candy bar. She gave Sue 25¢.

5. A boy bought an 18¢ box of cookies. He gave Sue 50¢.

6. Mrs. Smith bought a pound of ham salad. She gave Sue a dollar bill.

7. A customer bought a 59¢ box of cookies and gave Sue 75¢.

8. Carl sold a pound of ham salad to a man who gave Carl a $5 bill. What coins and how many $1 bills will Carl give the man in change?

9. Sue sold a customer $1.98 worth of groceries. The customer gave Sue a $5 bill. Sue gave the customer 2 pennies and how many $1 bills in change?

10. Name the coins Sue would give in change from a half dollar after each of these sales.

47¢ 28¢ 21¢ 11¢
35¢ 25¢ 17¢ 40¢
43¢ 4¢ 30¢ 37¢

11. A customer bought $1.23 worth of groceries from Carl. He gave Carl a $5 bill. Here is how Carl counted the change: "$1.23, $1.24, $1.25, $1.30, $1.40, $1.50, $2.00, $3.00, $4.00, $5.00."

Tell what money Carl gave in change each time he said an amount after $1.23.

12. A customer spent $.94 and paid with a five-dollar bill. Name the coins and bills you would give in change.

13. Name the coins and bills you would give a customer who spent $.78 and gave you a $5 bill. Give the amounts you would say as you gave each coin or bill to the customer.

How Would You Answer?

1. Sue wanted to know if a package of cheese marked 7 oz. was as much as $\frac{1}{2}$ lb. of the same kind of cheese. What would you tell her?

2. Sue found there were no 1-lb. packages of cookies. She had a customer who wanted 1 lb. of cookies. Could Sue give the customer two $\frac{1}{2}$-lb. packages of the cookies?

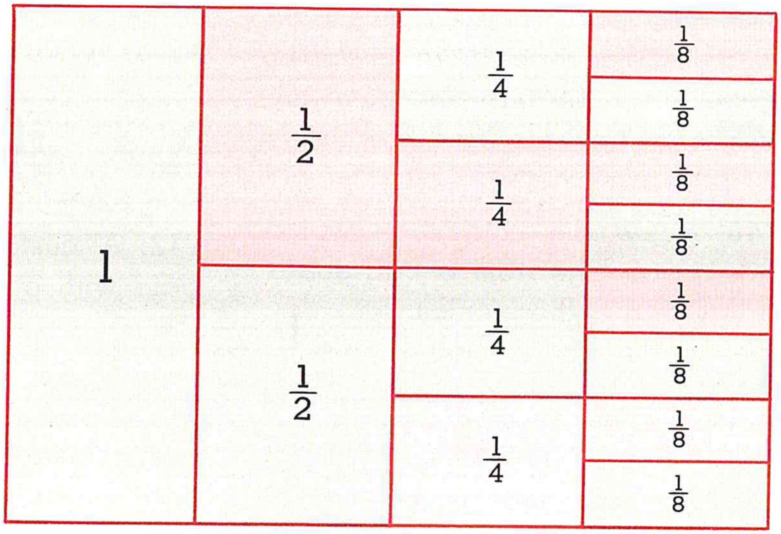
3. There were no quarters left in the cash register. Name the fewest coins Sue could use in place of 1 quarter when she made change.

4. Carl measured out some ham salad for a customer. Carl said the amount cost $.75. The customer said he wanted $.50 worth. Will Carl add more salad to the amount he had measured, or will he take some away?

5. A price card said, "Cookies, 39¢ and 59¢." If all the boxes on which the sign is placed hold the same kind of cookies, how can Sue tell which box to sell for 59¢?

6. Candy bars are priced at 4 for 29¢. What should Sue charge when someone wants to buy 1 bar?

CHART
ONE



Fractions That Are Equal

Study Chart One above. Then copy rows 1, 2, and 3. Use the right number for each question mark.

1. $1 = \frac{?}{2}$ $\quad 1 = \frac{?}{4}$ $\quad 1 = \frac{?}{8}$
2. $\frac{1}{2} = \frac{?}{4}$ $\quad \frac{1}{2} = \frac{?}{8}$ $\quad \frac{1}{4} = \frac{?}{8}$
3. $\frac{2}{4} = \frac{?}{8}$ $\quad \frac{3}{4} = \frac{?}{8}$ $\quad \frac{4}{8} = \frac{?}{2}$

Draw 6 circles to stand for pies. Label them A, B, C, D, E, and F.

4. Draw lines to cut pie A into four equal parts. Color two of these parts to show that they have been eaten.

Write two fractions that show the part of the pie that has been eaten.

5. Draw lines to divide pie B into 8 equal parts. Color $\frac{1}{2}$ of the pie. How many eighths of the pie did you color?

6. Draw lines to show that pie C has been cut into eighths. Color $\frac{7}{8}$ of the pie.

7. Draw lines to divide pie D into 8 equal parts. Color $\frac{1}{4}$ of the pie. How many eighths did you color?

8. Draw lines to divide pie E into eighths. Color $\frac{3}{4}$ of the pie. How many eighths did you color?

9. Divide pie F into fourths. Color $\frac{3}{4}$ of the pie. What fraction tells the part of pie F that is not colored?

10. What fraction tells how many eighths of pie F are white?

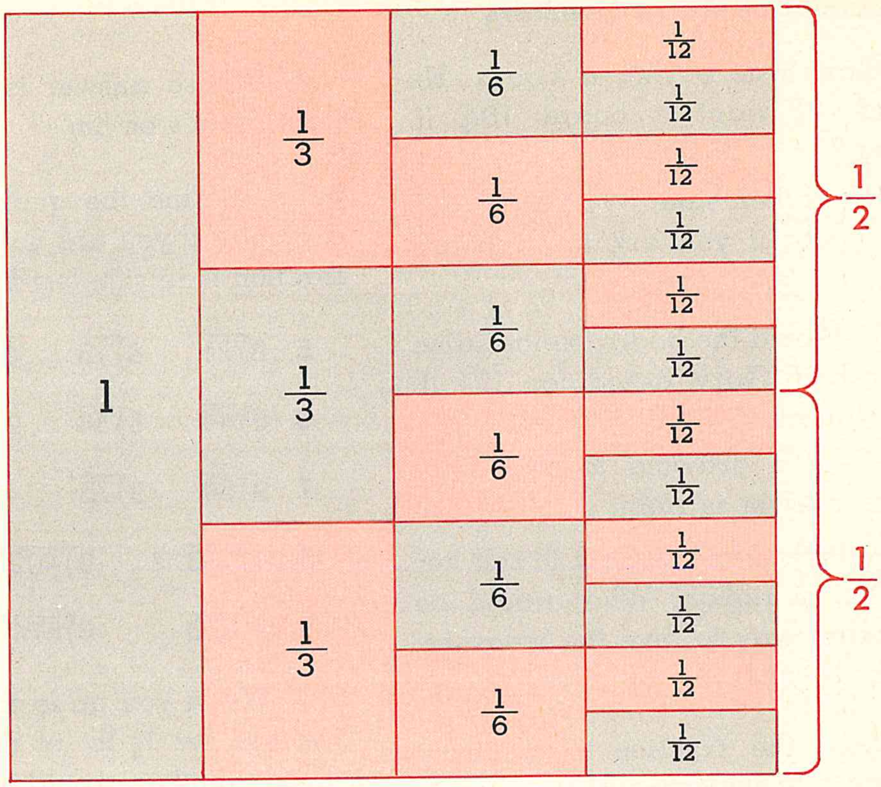


CHART TWO

Study Chart Two above. Copy ows 11 and 12. Use the right umber for each question mark.

11. $1 = \frac{?}{3}$ $1 = \frac{?}{6}$ $1 = \frac{?}{12}$

12. $\frac{1}{3} = \frac{?}{6}$ $\frac{1}{3} = \frac{?}{12}$ $\frac{2}{3} = \frac{?}{6}$

Draw 4 circles to stand for pies. abel them G, H, I, and J.

13. Draw lines to divide pie G nto 6 parts. Color $\frac{1}{3}$ of pie G. How nany sixths did you color?

14. Draw lines to divide pie H nto 6 equal parts. Color $\frac{2}{3}$ of pie H. ow many sixths did you color?

15. Draw lines to divide pie I into sixths. Color $\frac{3}{6}$ of pie I. How many twelfths is this?

16. Divide pie J into sixths. Color half of pie J. How many sixths equal $\frac{1}{2}$? How many twelfths equal $\frac{1}{2}$?

Write the fraction for each of the question marks.

17. $\frac{2}{4}$ in simplest form is ?

18. $\frac{2}{8}$ in simplest form is ?

19. $\frac{4}{8}$ in simplest form is ?

20. $\frac{4}{6}$ in simplest form is ?

Fractions in Mixed Numbers

Gary was buying a board. He said, "I want a board $10\frac{8}{12}$ ft. long."

His father said, "I think it will be better if you ask for a board that is $10\frac{2}{3}$ ft. long."

1. Would the board be the same length if Gary asked for $10\frac{2}{3}$ ft. instead of $10\frac{8}{12}$ ft?

Make a drawing to show that your answer is right.

2. Ruth asked a clerk to sell her $5\frac{6}{8}$ yd. of ribbon. What would be a better way to give the measurement $5\frac{6}{8}$ yd.?

■ **Give the fraction in a mixed number in simplest form.**

3. Jim and Ruth each worked the example $6\overline{)15}$. Jim said the quotient was $2\frac{3}{6}$. Ruth said she found that the quotient was $2\frac{1}{2}$.

Study Ruth's division below and explain why Jim's answer was different from hers.

RUTH

$$\begin{array}{r} 2\frac{3}{6} = 2\frac{1}{2} \\ 6\overline{)15} \\ \underline{12} \\ 3 \end{array}$$

4. Whose answer is in simplest form, Ruth's or Jim's?

▶ Copy. Find the quotients. Draw a picture if you are not sure that a fraction is in simplest form.

5. $9\overline{)21}$ $8\overline{)18}$ $4\overline{)38}$ $6\overline{)20}$

6. $8\overline{)44}$ $6\overline{)34}$ $9\overline{)42}$ $8\overline{)66}$

7. $8\overline{)54}$ $9\overline{)75}$ $4\overline{)22}$ $9\overline{)57}$

8. $4\overline{)138}$ $9\overline{)402}$ $6\overline{)392}$

9. $8\overline{)650}$ $6\overline{)574}$ $9\overline{)735}$

10. When you go to the store, do you ask for $1\frac{4}{8}$ lb. of meat? What mixed number would you use instead of $1\frac{4}{8}$?

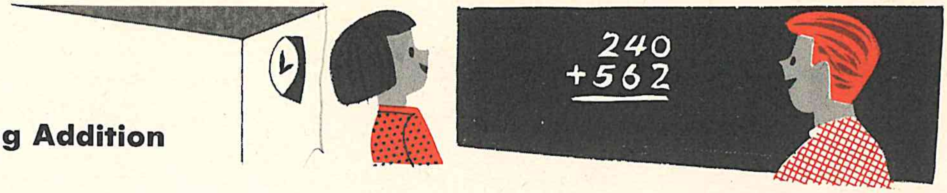
11. Would you say that Jack was $59\frac{6}{8}$ in. tall? Give a reason for your answer.

12. Do you ever hear anyone say he studied his lessons $1\frac{6}{12}$ hr.? What would he say?

▶ Copy these mixed numbers. If any of the fractions are not in simplest form, change them to simplest form.

13. $4\frac{7}{8}$ $3\frac{4}{12}$ $15\frac{10}{16}$ $12\frac{1}{2}$ $3\frac{6}{10}$

14. $3\frac{4}{9}$ $5\frac{6}{9}$ $12\frac{5}{15}$ $10\frac{6}{15}$ $2\frac{3}{8}$



Reviewing Addition

Before you work the examples, see if you can answer these questions.

1. What is the answer in addition called? (6)

2. Which column in the examples on this page has the most addends? (6)

3. Bill said the last column in row 6 is easiest to add. What did he mean? (17)

4. What is the correct way to write money numbers that you are getting ready to add? (23)

▶ Write the sums on folded paper.

5.	3	6	9			
	5	3	8	4	8	7
	6	9	5	2	7	3
	+7	+6	+9	+3	+2	+5

6.	4				
	7	6	45	17	0
	5	8	13	52	6
	6	3	34	26	2
	4	4	71	53	0
	+1	+2	+20	+24	+9

7.	34	754	265	98
	+18	+6	+89	+7

▶ Copy in straight columns. Find the sums. (23)

8. $1.87, $14.01, $21.10, $.04

9. Four dollars and five cents, three dollars and fifteen cents, twenty-eight dollars and sixteen cents.

▶ Write the sums on folded paper.

10.	46			
	5			298
	125			262
	37	249	916	137
	+4	+824	+401	+420

11.	194	100	432	52
	289	698	78	4
	9	47	128	506
	78	260	93	14
	+432	+315	+4	+896

12.	$\frac{2}{9}$	$\frac{1}{8}$		
	$\frac{5}{9}$	$\frac{3}{8}$	$\frac{3}{16}$	$\frac{4}{12}$
	$+\frac{1}{9}$	$+\frac{3}{8}$	$+\frac{2}{16}$	$+\frac{7}{12}$

13.	$\frac{3}{7}$	$\frac{4}{7}$	$\frac{5}{12}$	$\frac{2}{9}$
	$+\frac{2}{7}$	$+\frac{2}{7}$	$+\frac{2}{12}$	$+\frac{5}{9}$

14. For special addition practice, see pages 322 and 329-332.

DAYS OF THE WEEK	
Sunday	(Sun.)
Monday	(Mon.)
Tuesday	(Tues.)
Wednesday	(Wed.)
Thursday	(Thurs.)
Friday	(Fri.)
Saturday	(Sat.)

MONTHS OF THE YEAR	
January	(Jan.)
February	(Feb.)
March	(Mar.)
April	(Apr.)
May	
June	
July	
August	(Aug.)
September	(Sept.)
October	(Oct.)
November	(Nov.)
December	(Dec.)

JANUARY

SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1 day (da.) = 24 hours (hr.)
7 days (da.) = 1 week (wk.)
12 months (mo.) = 1 year (yr.)
365 days = 1 year
366 days = 1 leap year

Longer Measures of Time

1. You studied some of the measures of time on page 203. On the table given there, what was the shortest measure of time given? The longest?

2. It takes about 1 second to say, "One hundred one." Count from one hundred one through one hundred ten. About how many seconds passed while you were counting?

3. If you practiced a music lesson for $\frac{1}{2}$ hr., how many minutes would you practice?

4. What measure of time given in the table above is next after the hour in length of time?

5. Study the spelling of the days of the week. Close your book. Try to write the days of the week correctly and in order.

Open your book and check your work. Study days you left out or misspelled. Try writing all the days again.

6. How many months equal a year?

7. Use a calendar. Find out which months have 31 days. Which have 30 days.

In a regular year, February has 28 days.

8. You can find the number of

days in a regular year if you copy and finish this work.

$$\begin{array}{rrl} 7 \text{ mo. } (31 \text{ da.}) & 7\times31= & ?\\ 4 \text{ mo. } (30 \text{ da.}) & 4\times30= & ?\\ +1 \text{ mo. } (28 \text{ da.}) & 1\times28= & +?\\ \hline 12 \text{ mo., or } 1 \text{ yr., } = & \longrightarrow & ? \text{ da.} \end{array}$$

9. Almost every fourth year is a leap year. How many days are there in a leap year?

10. A leap year has 1 more day than a regular year. This extra day is added to the number of days that February usually has. How many days will there be in February in a leap year?

You can tell which years are leap years in this way. If the two right-hand figures can be divided by 4 evenly, the year is a leap year.

The years 1952, 1956, and 1960 are leap years. The years 1951, 1957, and 1959 are not leap years.

11. Which of these are leap years?

1620 1492 1775 1914 1860

If a year ends in two 0's, it is a leap year only if the entire number of years can be divided evenly by 400. A quick way to find out is to see if the two left-hand figures of the year contain 4 evenly.

Leap Years	Not Leap Years
1200	1300
1600	1800
2000	1900

Ann read a story about George Washington. It said he was born in 1732 and became president in 1789.

ANN

$$\begin{array}{r} 1789\\ -1732\\ \hline 57 \end{array}$$

12. What did Ann do to find how old George Washington was when he became president?

13. Lincoln was born in 1809. He became president in 1861. How old was he when he became president?

14. Columbus discovered America in the year of 1492. This was how many years before Lincoln was born?

15. Make up a rule for finding the number of years between two given dates.

Find how many years it was between these years.

16. From 1775 to 1941

17. From 1620 to 1863

18. From 1898 to 1918

19. From 1812 to 1900

Reviewing Subtraction

1. Show on a number line that the difference between 14 and 6 is 8. (33)

2. Show two ways to check the subtraction example 25 − 13 = 12. (40)

3. In which of the following subtractions must you borrow from tens place? (47)

$$\begin{array}{lr@{\qquad}lr@{\qquad}lr} \textbf{A.} & 478 & \textbf{B.} & 652 & \textbf{C.} & 394 \\ & -297 & & -321 & & -279 \\ \cline{2-2}\cline{4-4}\cline{6-6} & 181 & & 331 & & 115 \end{array}$$

4. Write the basic subtraction fact that you use when you subtract 6 from 24. (41)

Find the differences. Write your answers on folded paper.

$$\mathbf{5.}\quad \begin{array}{rrrrrr} 16 & 17 & 12 & 15 & 18 & 14 \\ -7 & -8 & -3 & -7 & -9 & -5 \\ \hline \end{array}$$

$$\mathbf{6.}\quad \begin{array}{rrrr} 54 & 87 & 45 & 89 \\ -22 & -85 & -39 & -49 \\ \hline \end{array}$$

$$\mathbf{7.}\quad \begin{array}{rrrr} 683 & 954 & 939 & 698 \\ -401 & -636 & -924 & -420 \\ \hline \end{array}$$

$$\mathbf{8.}\quad \begin{array}{rrrr} 864 & 753 & 901 & 540 \\ -107 & -578 & -264 & -173 \\ \hline \end{array}$$

Write examples 9, 10, and 11 ready for subtracting. Find the answers. (51)

9. \$49.50 − \$4.25 = □

10. Take sixty-five cents from four dollars and seven cents.

11. Take one dollar and ten cents from five dollars and eight cents.

Write answers on folded paper.

$$\mathbf{12.}\quad \begin{array}{rrrr} 2035 & 4067 & 1000 & 4079 \\ -1940 & -3005 & -909 & -89 \\ \hline \end{array}$$

$$\mathbf{13.}\quad \begin{array}{rrrr} 3609 & 5601 & 4000 & 4139 \\ -106 & -604 & -3 & -2840 \\ \hline \end{array}$$

$$\mathbf{14.}\quad \begin{array}{rrr} \$5.67 & \$8.14 & \$5.45 \\ -2.25 & -4.52 & -3.50 \\ \hline \end{array}$$

$$\mathbf{15.}\quad \begin{array}{rrr} \$4.05 & \$1.01 & \$0.85 \\ -.98 & -.86 & -0.03 \\ \hline \end{array}$$

$$\mathbf{16.}\quad \begin{array}{rrrrrr} \frac{7}{12} & \frac{15}{16} & \frac{4}{8} & \frac{5}{10} & \frac{7}{9} & \frac{4}{5} \\ -\frac{2}{12} & -\frac{8}{16} & -\frac{1}{8} & -\frac{4}{10} & -\frac{3}{9} & -\frac{2}{5} \\ \hline \end{array}$$

$$\mathbf{17.}\quad \begin{array}{rrrrrr} \frac{5}{16} & \frac{12}{13} & \frac{2}{3} & \frac{6}{12} & \frac{4}{7} & \frac{3}{4} \\ -\frac{3}{16} & -\frac{6}{13} & -\frac{1}{3} & -\frac{5}{12} & -\frac{2}{7} & -\frac{1}{4} \\ \hline \end{array}$$

18. You will find special subtraction practice on pages 324 and 333-336. See how well you can do on these examples.

Reading and Writing Large Numbers

1. How many thousands are there in the number 823,514? (167)

2. Write a 6-place number that means 200 thousands, 8 hundreds, 5 tens, and 0 ones. (167)

3. Write the next number after 389,999. The next number after 99,999. (167)

4. Copy and place a comma correctly in these numbers. (166)

54081 469134 67002 982400

5. In the number 14,568, the 4 is in what place? (4)

6. In the number 250,138, what does the zero show? (3)

Write these numbers in figures. (166)

7. Forty-five thousand twenty.

8. Two hundred fifteen thousand.

9. Five thousand nine.

10. Nine thousand thirty-one.

Review Problems

1. A building that was built in 1865 was torn down in 1958. How many years old was the building when it was torn down? (301)

2. Two children kept a record of the number of library books used each day. At the end of 5 days, they had recorded these numbers: 216; 222; 127; 300; 230. What was the average number of books used each of these days? (230, 231)

3. At 3 lb. for 35¢, what will 6 lb. of bananas cost? What will 9 lb. cost? (239)

4. A man gave the clerk a $5 bill after buying $3.70 worth of groceries. Name in order the coins and bills that the clerk will give in change to the man. (294)

5. Mr. Jackson bought a half dozen size 16 shirts at $5.98 each. How much did he pay for all the shirts? (247)

6. Sue has 50¢. How much will she have left after buying 6 pencils at 5¢ each? (232)

7. Jerry bought greeting cards at 6¢ each. He sold them at 10¢ each. How much did he make in selling 50 cards? (232)

8. A man bought a pair of shoes for $11.85 and a pair of shoe strings for 25¢. How much did he spend? (232)

Reviewing Multiplication

1. If 1 bu. of oats weighs 32 pounds, how many pounds will 10 bu. weigh? Give a rule that will help you answer quickly. (187)

2. One bu. of coal weighs about 80 lb. How many pounds will 100 bu. weigh? What rule will you use to help you answer quickly? (251)

3. One magazine weighs 2 pounds. How many pounds will 125 of these magazines weigh? Use the easier way to multiply. (288)

4. How many partial products will you have when you multiply 365 by 127? (252)

5. Joan multiplied 328 by 47. Look at her work. When she multiplied 328 by the 4 tens in 47, how did she show that her partial product was tens? (195)

JOAN

$$\begin{array}{r} 328 \\ \times\ 47 \\ \hline 2296 \\ 1312 \\ \hline 15{,}416 \end{array}$$

6. How many partial products do you usually have when your multiplier is a three-place number? (252)

7. Jack multiplied 385 by 150. The multiplier 150 is a three-place number. Look at Jack's multiplication and tell why he had only two partial products in his work. (255)

JACK

$$\begin{array}{r} 385 \\ \times\ 150 \\ \hline 19250 \\ 385 \\ \hline 57{,}750 \end{array}$$

8. Bob said you will show only two partial products when you multiply 346 by 302. Do this multiplication and show that Bob was right. (256)

9. Gary multiplied 73 by 14. To check his work, he multiplied 73 by 5 and 73 by 9, and added the two products. Why will the sum of these two products give him the same answer as 73 multiplied by 14? (75)

10. In which of these multiplications do you carry 3 to hundreds place? In which do you carry twice? (62, 75)

A. $\begin{array}{r} 614 \\ \times 2 \\ \hline 1228 \end{array}$ **B.** $\begin{array}{r} 207 \\ \times 4 \\ \hline 828 \end{array}$ **C.** $\begin{array}{r} 493 \\ \times 4 \\ \hline 1972 \end{array}$

Testing Your Multiplication

Copy ready to work. Find the products.

1. 3×23   4×46   8×96   (62)

2. 829 ×8   504 ×9   826 ×7   (75)

3. 38 ×45   63 ×36   96 ×58   (196)

4. 486 ×72   385 ×84   398 ×37   (247)

5. 136 ×300   642 ×200   153 ×600   (251)

6. 248 ×320   535 ×450   367 ×380   (255)

7. 472 ×203   936 ×407   412 ×506   (256)

8. 354 ×725   509 ×416   520 ×293   (252)

Find the products in the easier way. (288)

9. 64 ×623   29 ×485   73 ×642

10. 36 ×132   45 ×316   58 ×413

Copy. Check the products by multiplying twice and adding the two products. (75)

11. 75 ×19   68 ×14   94 ×16   38 ×12

Copy. Check products by exchanging places of multiplicand and multiplier and multiplying again. (253)

12. 489 ×416   642 ×835   973 ×904

Copy. Show that the product means either cents, or dollars and cents.

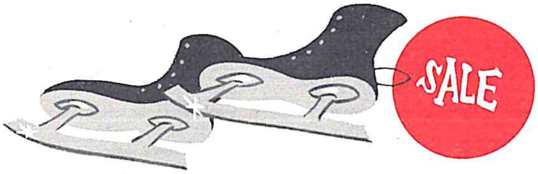
13. 45¢ ×2   15¢ ×4   28¢ ×3   (209)

14. $.09 ×6 $.79 ×5 $.95 ×8   (209)

15. $4.38 ×42 $2.69 ×6   (141)

Copy. Find the products. Watch the zeros.

16. 402 ×350   150 ×206   553 ×300   469 ×650



Thinking About Word Problems

1. If you know what a knife costs and what a kite costs, how do you find the cost of both?

2. If you know the cost of a dozen oranges, how do you find the cost of 1 orange?

3. You know how much money you have in your pocket. You know the cost of what you are going to buy. How can you find how much money you will have left after you pay for the article?

4. If you know the cost of 1 pound of candy, how can you find the cost of 3 pounds of this candy?

5. You are saving to buy a pair of skates. You know what the skates will cost. If you now have 75¢ saved, how can you find how much more money you need to buy the skates?

6. If Tom earns the same amount of money each day except Sunday, how can you find how much he earns in a week?

7. You know how much rent your family pays each month. How can you find what the rent is for 1 year?

8. You know the cost of 1 pound of black pepper. How can you find the cost of $\frac{1}{4}$ pound of the pepper?

9. Jack knows the score his team made in each of four games. What will he do to find the average score for the four games?

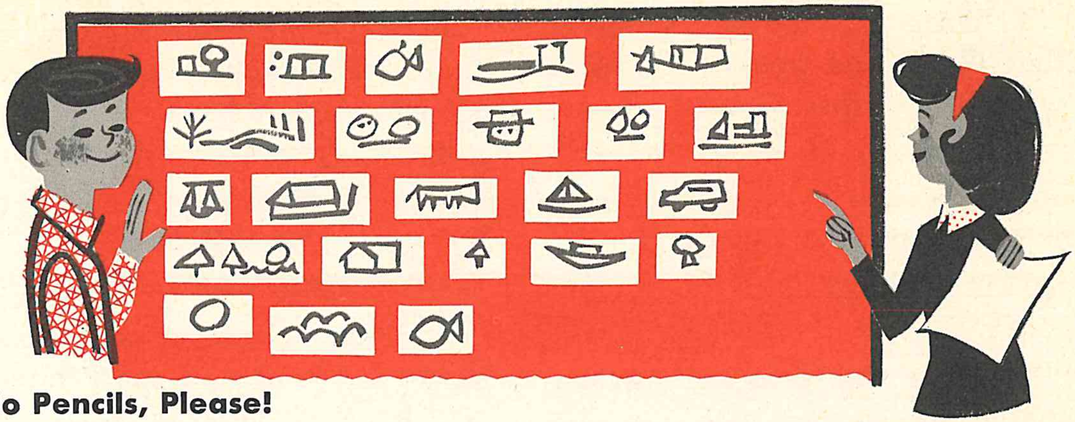
10. You know the number of feet in a rope. You know that it is to be cut into 10-ft. pieces to make jumping ropes. How can you find the number of jumping ropes there will be?

11. Apples are selling at 3 lb. for 59¢. What will you do to find the price of 9 lb. of these apples?

12. If you know the number of tons a truck will carry when fully loaded, how can you find the number of tons carried in 6 full loads?

13. If you know the number of miles you can travel on 1 gallon of gasoline, how can you find the number of miles you can travel on 12 gallons of gasoline?

14. You are taking a trip of 450 miles. If you know how far you have already gone, how can you tell how far you have left to travel?



No Pencils, Please!

1. Jack put pictures on the bulletin board. He put 6 rows with 5 pictures in a row. How many pictures were there?

2. There were 24 pictures on another bulletin board. Joan counted 4 rows of pictures. How many pictures were there in a row?

3. The teacher had 6 doz. new pencils. She asked Sue to sharpen $\frac{1}{2}$ of them. How many pencils did Sue sharpen?

4. Mary cleaned 12 erasers. Joe cleaned 15, and there were 10 erasers that did not need cleaning. How many erasers were there in all?

5. Tom counted 64 crayons. He said $\frac{1}{4}$ of them were new. How many new crayons were there?

6. The classroom thermometer read 70°. The thermometer that Bob put outdoors on the window sill read 29°. It was probably what season of the year? How can you tell?

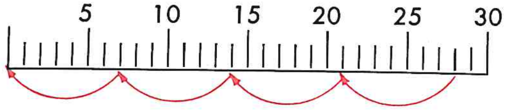
For each amount in the first column, find an equal amount in the second column.

7.	$\frac{1}{2}$ yard	a.	1 peck
8.	$\frac{1}{3}$ foot	b.	18 inches
9.	$\frac{1}{2}$ foot	c.	8 ounces
10.	$\frac{1}{2}$ quart	d.	144 things
11.	$\frac{1}{4}$ bushel	e.	1 pint
12.	1 gross	f.	4 inches
13.	$\frac{1}{2}$ pound	g.	6 inches
14.	$\frac{1}{3}$ dozen	h.	2000 pounds
15.	5280 feet	i.	12 hours
16.	$\frac{1}{2}$ day	j.	1 mile
17.	1 ton	k.	1 minute
18.	60 seconds	l.	4 things

Reviewing Division

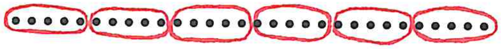
1. Write the division question that Gary was trying to answer when he used this number line. (85)

GARY



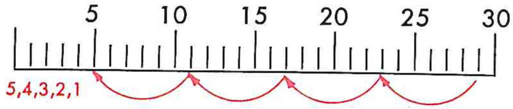
2. Write the division question that Betty showed with this dot drawing. (86)

BETTY



3. Carol showed an uneven division on her number line. What was the remainder, or left-over part? (97)

CAROL



4. For each set of numbers, write two basic division facts. (96)

7, 9, 63 8, 9, 72

5. For each set of numbers, write two basic multiplication facts and two basic division facts. (107)

7, 8, 56 9, 6, 54

6. Write the basic division fact that Tom thought when he wrote his first quotient figure. (123)

TOM 7☐
8)560

7. When Tom wrote the quotient figure 7, how did he show that he was really dividing 56 tens by 8? (103)

8. What other figure must Tom write in his quotient? What will this second quotient figure show? (112)

9. Write a number that means 39 tens and 5 ones. (102)

10. In which child's division will the first quotient figure mean hundreds? Tens? Ones? (112)

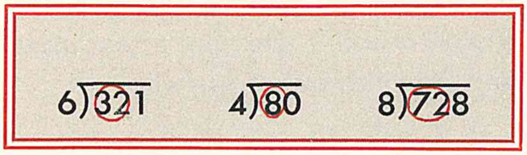
BILL	RUTH	CARL
7)42	4)85	3)609

11. What does each zero in Jim's quotient show? (243)

JIM 2000
4)8000

12. Make a dot drawing to show that $\frac{1}{3}$ of 15 equals 5. (95)

13. The ring shows the first partial dividend in each division below. Write the second partial dividend for each division. (177)

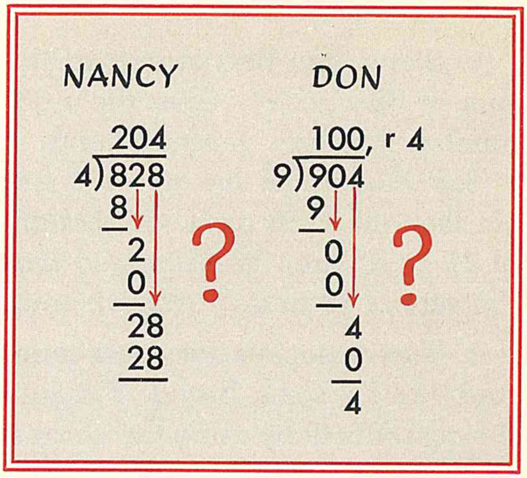


Copy. Find the quotient. Check by multiplying.

14. 6)664 5)105 (103)

15. 3)211 4)892 (114)

16. Are the following divisions correct? (245)



Testing Your Division

Copy. Find the quotients.

1. 2)486 3)696 4)844 (103)

Copy. Find the quotients. Show all the work you do as you divide.

2. 6)306 9)279 5)455 (103)

3. 3)192 8)304 7)532 (103)

Copy. Find the quotients. Write the left-over part as a remainder.

4. 8)603 9)760 6)9134 (97)

Copy. Find the quotients. Divide the left-over part and write a fraction as part of each quotient.

5. 4)37 5)29 3)146 (152, 153)

Copy. Find the quotients. Be sure you have the right number of figures in each quotient.

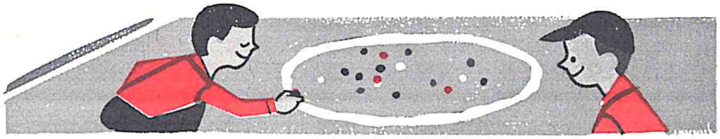
6. 5)4000 8)1624 6)1206 (243)

Copy. Find the quotients. Show that each quotient means either cents or dollars and cents. (141)

7. 4)\$.80 3)\$5.19 5)\$6.00

8. $\frac{1}{4}$ of 156 = ☐ $\frac{1}{9}$ of 45 = ☐ (216)

Estimating Answers



1. Show how Bob estimated the sum of 38 and 21. Give the right number for each question mark.

Bob thought of the nearest ten. He thought of 38 as ?. He thought of 21 as ?. Then he estimated that the sum of 38 and 21 was about ?.

2. Tom paid 29¢ for some meat and 18¢ for some bread. Estimate the cost of both by using the nearest tens.

3. There were 12 ft. of wire in one roll and 59 ft. in another. Estimate how many feet of wire there were in both rolls by using the nearest tens.

4. Jim had 99 marbles. He gave Bob 42 of them. To find how many he had left, Jim thought, "100 − 40." What was Jim's estimated answer? What was the exact answer?

Copy. Round to the nearest ten. Estimate the difference.

5. $79-59=?$ $\quad 48-32=?$

6. $72-19=?$ $\quad 81-52=?$

7. Bill said that $19\times 29=3871$. Then he said, "I know my answer is wrong, because 19 is close to 20, and 29 is almost equal to 30. $20\times 30=600$." Do Bill's example and find the exact answer.

8. Copy. Round to the nearest tens. Estimate the products.

$9\times 41=?$ $\quad 51\times 49=?$

9. At 9¢ each, estimate the cost of 18 pencils.

10. If each brick of ice cream is cut into 8 pieces, estimate the number of pieces in 42 bricks.

11. If 18 persons can sit in each row, estimate the number that can be seated in 12 rows.

Mixed Practice

▶ Copy. Find the exact answers.

1. $\begin{array}{r}7854\\396\\+3473\\\hline\end{array}$ $\quad \begin{array}{r}5211\\1537\\+261\\\hline\end{array}$ $\quad \begin{array}{r}1745\\237\\+1634\\\hline\end{array}$

2. $\begin{array}{r}23{,}152\\-17{,}141\\\hline\end{array}$ $\quad \begin{array}{r}41{,}243\\-14{,}562\\\hline\end{array}$

3. $\begin{array}{r}763\\\times 9\\\hline\end{array}$ $\quad \begin{array}{r}247\\\times 24\\\hline\end{array}$ $\quad \begin{array}{r}475\\\times 56\\\hline\end{array}$ $\quad \begin{array}{r}204\\\times 4\\\hline\end{array}$

4. $7\overline{)5936}$ $\quad 8\overline{)6560}$ $\quad 4\overline{)2520}$

5. $\frac{1}{4}$ of 336 $\quad \frac{1}{7}$ of 490 $\quad \frac{1}{3}$ of 96

Choosing Sensible Answers

When you have found the answer to a problem, it is wise to ask yourself, "Is this a sensible answer to this problem?"

Jim said that 2 doz. cookies at \$.30 a dozen would cost \$6.00. Jack told Jim that this was not a sensible answer. He said Jim should know that cookies would not cost that much.

If the answer you get to a problem does not seem sensible, check your work to see what is wrong.

For the following questions choose the most sensible answer.

1. Jack was giving a report about a very large city. He forgot the population. The population of a large city is most likely to be 6000; 600; 600,000.

2. Joe was telling about a fast runner on his school team. He said the runner ran the 50-yd. dash in $13\frac{3}{5}$ min.; $13\frac{3}{5}$ sec.; $\frac{1}{2}$ hr.

3. I owe the grocer \$12.95. When I go to pay this amount, I should take with me two \$5 bills; one \$10 bill; three \$5 bills.

Do not use your pencils. Estimate, and then choose the best answer from those given.

4. At 29¢ each, 3 notebooks will cost 30¢; 69¢; 87¢.

5. Joan spent 21¢ for a box of soap, 19¢ for a yard of ribbon, and 49¢ for a handkerchief. In all, she spent 50¢; 89¢; 75¢.

6. Sue's class bought 5 books and paid \$9.95 for all of them. On an average, each book cost \$1.99; \$5.00; \$2.25.

7. Jim had a \$10 bill. He spent \$4.95. His change from the \$10 bill would be \$6.05; \$3.50; \$5.05.

8. Mr. Brown says he gets about 18 mi. on a gallon of gasoline when he is driving on the turnpike. At this rate, on 5 gallons he can drive 36 mi.; 150 mi.; 90 mi.

9. Mr. Brown drove 1197 mi. in 3 days. At this rate, in one day he drove 399 mi.; 1200 mi.; 500 mi.

10. At \$9.95 a set, 4 sets of books will cost \$10.00; \$39.80; \$50.20.

11. At \$.95 a pound, 4 lb. of meat will cost about \$40.00; \$.40; \$4.00.

Reviewing Two-Step Problems

1. Betty had $5.00. She spent $.40 for bus fare and $.95 for lunch. How much money did she have left?

To find the answer to this problem, what number question must you answer first? Then what must you do?

Alice wrote the two number questions for this problem. Look at her work.

ALICE $.40 + $.95 = ?
$5.00 − ? = ?

For each of these problems, write the two number questions that you must answer. Use question marks as Alice did.

2. Helen wanted to buy a hat priced at $6.85. She had only four $1 bills and a half dollar in her purse. How much more did she need to buy the hat?

3. Joe was making a 13-mi. trip on his bicycle. He rode 4 mi. and rested. Then he rode 6 mi. and rested. How much farther did he have to ride?

4. Sally gave a party. She invited 9 girls and 8 boys. Three boys did not come to the party. All the others came. How many children were there at the party?

5. Mary bought 3 yards of cloth at $3.98 a yard, and had to pay $.08 sales tax. How much did she pay in all?

6. Joe bought 4 rabbits at $.45 each and 1 rabbit at $.65. How much did he pay in all for these rabbits?

7. Joan bought 9 candy bars at 3 for 29¢. What did she pay for all of them?

8. This is Ann's reading record for 5 days: 15 pages; 9 pages; 11 pages; 6 pages; 9 pages. What was the average number of pages she read per day?

9. Sue bought 6 oranges for 59¢. Did she pay more or less than she would have if she had bought 6 oranges at 7¢ each?

10. Which is cheaper, a 4-lb. roast for $3.70 or 4 lb. of roasting meat at $.89 a pound?

11. Joe bought ten 15¢ cards. What did he have left from $5?

Using Addition and Subtraction

Look at the number questions below.

A. 15 − 8 = ☐   C. 25 + 9 = ☐

B. 15 + 8 = ☐   D. 25 − 9 = ☐

Read each of the following problems. Decide which of the number questions, A, B, C, or D, you can use to solve the problem.

1. Bill's score in the first half of the game was 15 points. His score in the second half was 8 points. What was his total score?

2. Jim had 25 little chicks. He gave 9 of them away. How many did he have left?

3. Gary had 15 rabbits. Tom had 8 rabbits. Tom had how many fewer than Gary?

4. Ann bought 25 apples. She put them into a basket where there were 9 apples. How many apples were there in the basket then?

5. Jack finished 15 problems. Mary finished 8 less than Jack did. How many problems did she finish?

6. Bob sold 9 magazines one day and 25 the next day. How many did he sell in the two days together?

7. Carol saw 15 pencils in the pencil box. Of these, 8 were sharpened. How many were not sharpened?

8. Betty found 25 hairpins in a package. She said she needed 9 more pins. How many pins did she need in all?

9. Jim had 15 qt. of berries. He sold 8 qt. How many quarts did he have left to sell?

10. Don has 25 spelling words to study. He has studied 9 of them. How many more must he study?

11. Eight is how much less than 15?

Using Multiplication

Joe's little brother Sam was helping Joe count their trading cards. They had 8 packages with 25 cards in each package.

1. Look at Joe's way of finding the answer. Why is it better than Sam's?

SAM

$$\begin{array}{r} 25\\ 25\\ 25\\ 25\\ 25\\ 25\\ 25\\ +25\\ \hline \boxed{?} \end{array}$$

JOE

$$\begin{array}{r} 25\\ \times 8\\ \hline \boxed{?} \end{array}$$

2. Find the answer to Sam's work and to Joe's. Joe said that multiplication is a short way to find the total of several equal amounts. Was Joe right?

3. How many equal amounts was Sam adding?

4. By what number did Joe multiply?

5. Jack says he spends $4.35 each week for carfare and lunch at school. What will he spend for these things in 29 weeks?

6. At $.40 a foot, what will Jim pay for 12 feet of lumber?

7. If 5280 ft. equal 1 mi., how many feet equal 5 mi.?

8. One bushel of oats weighs 32 lb. What will 425 bu. weigh? Use the easier way to multiply.

9. Show that 65×28 has the same product as 28×65.

10. Bob multiplied 25 by 8 and 25 by 4. Then he added the products. Why did he get the same answer when he multiplied 25 by 12?

11. If 1 yd. equals 36 in., how many inches will 25 yd. equal?

12. Joan had some coupons. Each coupon counted for 6 points in getting a prize. How many points were 500 coupons worth? Use a quick way to multiply by 500.

13. Carl planted 15 bulbs in a row. How many did he plant in 10 such rows? Use a quick way to multiply by 10.

14. How many ounces of dates are there in 9 one-pound packages?

15. I can make 8 glasses of lemonade from 1 can of lemon juice. How many glasses can I make from 12 cans?

BETTY Number of children in each group → $\begin{array}{r}6\\4\overline{)24}\end{array}$ ← Number of groups of children ← Total number of children

DON Number of children to get a share → $\begin{array}{r}6\\4\overline{)24}\end{array}$ ← Number of apples in each share ← Total number of apples

Using Division

1. Make up a word problem for the division Betty put on the chalkboard.

2. Make up a word problem for the division Don put on the chalkboard.

You divide when you want to find —

- How many equal parts or equal groups.
- How many in each equal part or share.

Tell which of the following problems ask you to find how many equal parts, or equal groups.

3. Bill had 15 basic sum cards. He put 3 of them in each row. How many rows did he make?

4. Bill has 35 pennies. He wants to share them equally among 7 boys. How many pennies will each boy get?

5. Bob has a wire that is 42 ft. long. How many pieces will he have if he cuts the wire into pieces each 6 ft. long?

6. Jim's teacher told him to divide 150 books equally among 3 classes. How many books did each class get?

7. Tom said he had 125 foreign postage stamps. He gave $\frac{1}{5}$ of them to Jerry. How many stamps did Jerry get?

Mixed Practice

1. $$\begin{array}{r}551\\8428\\39\\592\\+7631\\\hline\end{array}\qquad\begin{array}{r}3340\\1562\\831\\2046\\+7504\\\hline\end{array}\qquad\begin{array}{r}2601\\1432\\25\\2106\\+761\\\hline\end{array}$$

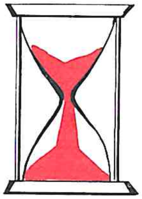
2. $$\begin{array}{r}3900\\-2401\\\hline\end{array}\qquad\begin{array}{r}5104\\-1605\\\hline\end{array}\qquad\begin{array}{r}6203\\-2192\\\hline\end{array}$$

3. $$\begin{array}{r}935\\\times8\\\hline\end{array}\qquad\begin{array}{r}308\\\times37\\\hline\end{array}\qquad\begin{array}{r}846\\\times6\\\hline\end{array}\qquad\begin{array}{r}275\\\times7\\\hline\end{array}$$

4. $6\overline{)5364}$ $9\overline{)7587}$ $7\overline{)3577}$

5. $6.05 × 28 $12.17 − $9.02

Measuring Improvement — Test 12



This is the twelfth and last improvement test. You should make the best score of all on this test, since you have had much practice and many reviews. Do your very best.

Begin and stop when the teacher gives the signal.

Write sums on folded paper.

1.	64	314	538	928
	43	109	75	600
	85	684	32	78
	53	932	725	7
	+42	+415	+307	+51

Write the differences on folded paper.

2.	9000	2118	7390	5300
	−7	−95	−2390	−4901

3.	9994	6173	8247	4396
	−8987	−6000	−3009	−2289

Copy. Find the products.

4. $45.05 multiplied by 24

5. 36 × $9.00

6. 9 × 15¢

7. 462 × 825

8.	504	430	328	625
	×731	×249	×340	×302

Copy. Find the quotients.

9. $4\overline{)8000}$ $9\overline{)1809}$ $5\overline{)5025}$

10. $8\overline{)1784}$ $3\overline{)2721}$ $7\overline{)6370}$

11. $\frac{1}{4}$ of 820 $\frac{1}{9}$ of 153

Copy. Find the quotients. Write the left-over part as a fraction.

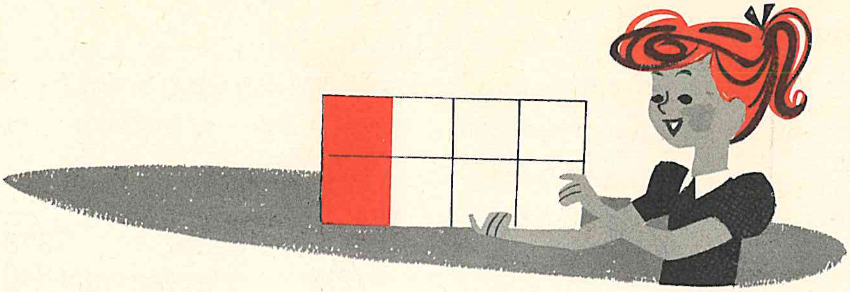
12. $8\overline{)25}$ $7\overline{)68}$ $4\overline{)15}$ $9\overline{)34}$

Special Helps

If you had trouble with "zero," use your index. Under "zero" find the pages where you will get help in division, in multiplication, in subtraction, and in addition.

Get special practice by doing again the improvement tests on which you got the lowest scores.

Do special practice from pages 329-345 on the work which seems to give you the most trouble.



Reviewing Fractions

1. Two eighths and five eighths equal ? eighths. (262)

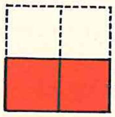
2. Three sixths and two sixths equal ? sixths.

3. Two tenths and five tenths equal ? tenths.

4. Write examples 1-3 above using figures only. Write the sums in figures. (262)

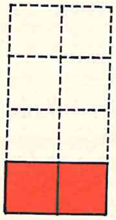
5. Write in simplest form the fraction given with each picture. (269)

A.



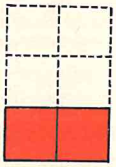
$\frac{2}{4} = \frac{?}{2}$

B.



$\frac{2}{8} = \frac{?}{4}$

C.

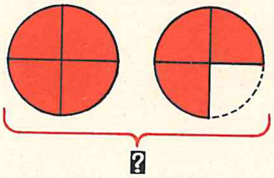


$\frac{2}{6} = \frac{?}{3}$

6. Which of the following fractions mean one whole? How can you tell? (273)

$\frac{3}{10}$ $\frac{9}{9}$ $\frac{5}{5}$ $\frac{5}{6}$ $\frac{2}{2}$

7. Write a mixed number that means the amount shown by this picture. (282)



8. Jerry said $\frac{1}{8}$ of a pie is larger than $\frac{1}{4}$ of the same pie because the denominator 8 is larger than the denominator 4. What do you think? (258)

9. Write a fraction with a numerator of 11 and a denominator of 12. (131)

10. Which of these fractions are not in simplest form? How can you tell? (271)

$\frac{3}{5}$ $\frac{6}{8}$ $\frac{2}{12}$ $\frac{5}{9}$ $\frac{7}{10}$ $\frac{4}{6}$

11. Is $\frac{1}{2}$ of one pie always equal to $\frac{1}{2}$ of another pie? Give a reason for your answer. (93)

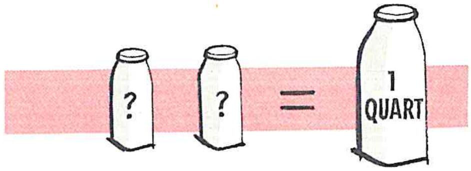
12. Which term of a fraction tells you how many equal parts there are in the whole? (129)

Reviewing Measures

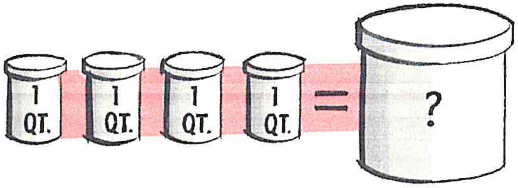
1. How many foot rulers will exactly cover the length of a yard measure? (147, 346)

2. Write the measure that belongs in place of each question mark in the pictures below. (199, 346)

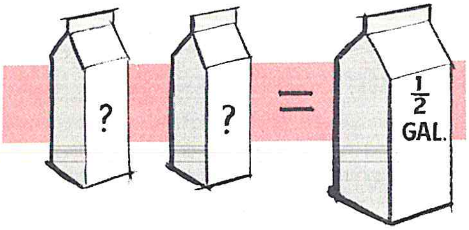
A.



B.


1 QT.
1 QT.
1 QT.
1 QT.
=
?

C.



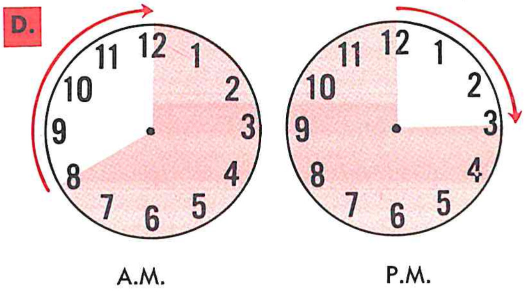
3. Name something that might be bought by the bushel. (200, 346)

4. Write these measures of time in order of their size. Write the smallest measure first. (300)

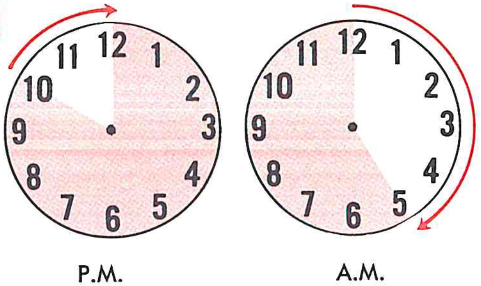
year day month week
hour second

5. Make up a word problem from the clocks shown in drawing D. In drawing E.

D.



E.



Write answers only. (346)

6. $\frac{1}{4}$ of 1 lb. = ☐ oz.
7. $\frac{1}{3}$ of 1 ft. = ☐ in.
8. $\frac{1}{2}$ of 1 da. = ☐ hr.
9. $\frac{1}{2}$ of 1 min. = ☐ sec.
10. 3 lb. = ☐ oz.
11. 4 ft. = ☐ in.
12. 2 T. = ☐ lb.
13. 5 da. = ☐ hr.
14. 2 yd. = ☐ in.
15. 7 doz. = ☐ things
16. 9 gal. = ☐ qt.

Things to Remember

1. In the number 66 there are two sixes. How can you tell which 6 means 6 tens? (3)

2. Gary said there are no hundreds in hundreds place in 34,094. How can he tell? (3)

3. In the number 125 there are how many tens? Are all of these tens shown in tens place? Explain your answer. (102)

4. How many ones are there in ones place in the number 365? How many ones are there in the whole number? (164)

5. Bob forgot to write the place-holders in a number which meant 5 thousands and 3 ones. He wrote 53. What should he have used as place-holders? Where should he have written place-holders? (3)

6. Why is the number 130,542 easier to read than the number 130542? (166)

7. Jim began with 43 as his multiplicand. His product was 4300. How can you tell quickly what his multiplier was? (251)

8. If you borrow 1 from thousands place, how many hundreds have you borrowed? (166)

No Pencils, Please!

1. What coins would you most likely get as change if you bought a 27¢ can of pears and gave the clerk a half dollar? (294)

2. What change would you give a man who spent $1.98 in your store and paid you with a $5 bill? (294)

3. Joe's chickens laid 3 doz. eggs each day for 1 week. How many dozen eggs was this? (232)

4. Mr. West has 209 chickens that are 1 yr. old. He also has 299 small chicks. Round to the nearest hundred and estimate how many chickens he has all together. (150)

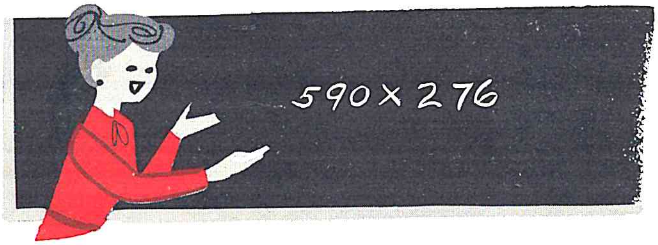
5. At a sale Bill bought six $5.00 books that were selling at $2.00 each. What did he pay for the six books? (232)

6. What does XLIX mean? Tom said you have to subtract and add to get the meaning of XLIX. What did he mean? (173)

7. Explain: I+I+I+I=IV (172)

8. Explain: L+X+X−I=LXIX (173)

Some Quick Reviews



For each review, write the examples. Find the answers.

REVIEW I

1. Add 5635 and 2375.
2. Add 34, 3905, and 7.
3. Add 7, 8, 0, 4, and 1.
4. Add $\frac{4}{12}$ and $\frac{3}{12}$.
5. Take 3153 from 8674.
6. Find the difference between 4503 and 2894.
7. 1989 is how much less than 5000?
8. $26 \times 972 = \boxed{?}$.
9. $605 \times 231 = \boxed{?}$.
10. Divide 15 sandwiches equally among 6 children. Make a drawing to show the part each child gets.

REVIEW II

1. $\$5.04 + \$.23 + \$14.63 + \$.04$
2. $\$98.07 - \$.09$
3. $\frac{11}{12} - \frac{4}{12}$
4. $\frac{1}{4}$ of 684
5. $\frac{1}{9}$ of 873
6. 4×738
7. 58×907
8. $15 \times \$1.75$
9. 590×276
10. Write $\frac{6}{12}$ in simplest form.
11. Divide 15 sticks of candy equally among 4 children. Decide if the left-over part should be divided or left as a remainder.

REVIEW III

1. $$\begin{array}{r} 1253\\ 2836\\ 3115\\ 4020\\ +5483\\ \hline \end{array} \qquad \begin{array}{r} 4106\\ 1894\\ 2153\\ 5213\\ +4738\\ \hline \end{array} \qquad \begin{array}{r} 2080\\ 3251\\ 6284\\ 4627\\ +2050\\ \hline \end{array}$$

2. $$\begin{array}{r} 3000\\ -1599\\ \hline \end{array} \qquad \begin{array}{r} 8480\\ -269\\ \hline \end{array} \qquad \begin{array}{r} \$12.15\\ \times 23\\ \hline \end{array}$$

3. $$\begin{array}{r} \$69.45\\ -5.15\\ \hline \end{array} \qquad \begin{array}{r} 839\\ \times 406\\ \hline \end{array} \qquad \begin{array}{r} 597\\ \times 450\\ \hline \end{array}$$

4. $9736 \div 8$
5. $7014 \div 7$
6. $5850 \div 9$

One Hundred Addition Facts

0 +0 0	0 +1 1	0 +2 2	0 +3 3	0 +4 4	0 +5 5	0 +6 6	0 +7 7	0 +8 8	0 +9 9
1 +0 1	1 +1 2	1 +2 3	1 +3 4	1 +4 5	1 +5 6	1 +6 7	1 +7 8	1 +8 9	1 +9 10
2 +0 2	2 +1 3	2 +2 4	2 +3 5	2 +4 6	2 +5 7	2 +6 8	2 +7 9	2 +8 10	2 +9 11
3 +0 3	3 +1 4	3 +2 5	3 +3 6	3 +4 7	3 +5 8	3 +6 9	3 +7 10	3 +8 11	3 +9 12
4 +0 4	4 +1 5	4 +2 6	4 +3 7	4 +4 8	4 +5 9	4 +6 10	4 +7 11	4 +8 12	4 +9 13
5 +0 5	5 +1 6	5 +2 7	5 +3 8	5 +4 9	5 +5 10	5 +6 11	5 +7 12	5 +8 13	5 +9 14
6 +0 6	6 +1 7	6 +2 8	6 +3 9	6 +4 10	6 +5 11	6 +6 12	6 +7 13	6 +8 14	6 +9 15
7 +0 7	7 +1 8	7 +2 9	7 +3 10	7 +4 11	7 +5 12	7 +6 13	7 +7 14	7 +8 15	7 +9 16
8 +0 8	8 +1 9	8 +2 10	8 +3 11	8 +4 12	8 +5 13	8 +6 14	8 +7 15	8 +8 16	8 +9 17
9 +0 9	9 +1 10	9 +2 11	9 +3 12	9 +4 13	9 +5 14	9 +6 15	9 +7 16	9 +8 17	9 +9 18

One Hundred Important Addition Questions

1.	1 +3	6 +2	3 +2	2 +5	5 +1	2 +9	9 +0	4 +4	1 +4	0 +8
2.	7 +0	3 +0	9 +1	1 +7	0 +1	5 +4	5 +5	7 +1	3 +6	4 +3
3.	4 +9	7 +4	5 +3	7 +6	8 +9	6 +3	9 +3	6 +7	2 +8	3 +5
4.	5 +6	9 +9	6 +4	3 +9	6 +6	9 +4	6 +5	4 +8	3 +4	7 +3
5.	8 +2	9 +2	5 +2	7 +2	3 +7	0 +6	1 +2	2 +3	8 +3	2 +6
6.	8 +8	4 +1	7 +7	0 +5	4 +0	5 +0	4 +2	8 +0	4 +5	2 +4
7.	8 +5	5 +9	9 +5	5 +8	9 +8	4 +7	8 +6	7 +9	8 +7	4 +6
8.	9 +6	5 +7	6 +8	7 +8	6 +9	8 +4	7 +5	9 +7	2 +7	3 +8
9.	1 +9	0 +2	1 +5	0 +4	1 +6	6 +0	1 +8	0 +9	1 +0	0 +3
10.	2 +2	8 +1	0 +0	2 +0	1 +1	2 +1	0 +7	6 +1	3 +3	4 +1

One Hundred Subtraction Facts

$\begin{array}{r} 0 \\ -0 \\ \hline 0 \end{array}$	$\begin{array}{r} 1 \\ -0 \\ \hline 1 \end{array}$	$\begin{array}{r} 2 \\ -0 \\ \hline 2 \end{array}$	$\begin{array}{r} 3 \\ -0 \\ \hline 3 \end{array}$	$\begin{array}{r} 4 \\ -0 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \\ -0 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ -0 \\ \hline 6 \end{array}$	$\begin{array}{r} 7 \\ -0 \\ \hline 7 \end{array}$	$\begin{array}{r} 8 \\ -0 \\ \hline 8 \end{array}$	$\begin{array}{r} 9 \\ -0 \\ \hline 9 \end{array}$
$\begin{array}{r} 1 \\ -1 \\ \hline 0 \end{array}$	$\begin{array}{r} 2 \\ -1 \\ \hline 1 \end{array}$	$\begin{array}{r} 3 \\ -1 \\ \hline 2 \end{array}$	$\begin{array}{r} 4 \\ -1 \\ \hline 3 \end{array}$	$\begin{array}{r} 5 \\ -1 \\ \hline 4 \end{array}$	$\begin{array}{r} 6 \\ -1 \\ \hline 5 \end{array}$	$\begin{array}{r} 7 \\ -1 \\ \hline 6 \end{array}$	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$	$\begin{array}{r} 9 \\ -1 \\ \hline 8 \end{array}$	$\begin{array}{r} 10 \\ -1 \\ \hline 9 \end{array}$
$\begin{array}{r} 2 \\ -2 \\ \hline 0 \end{array}$	$\begin{array}{r} 3 \\ -2 \\ \hline 1 \end{array}$	$\begin{array}{r} 4 \\ -2 \\ \hline 2 \end{array}$	$\begin{array}{r} 5 \\ -2 \\ \hline 3 \end{array}$	$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$	$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$	$\begin{array}{r} 9 \\ -2 \\ \hline 7 \end{array}$	$\begin{array}{r} 10 \\ -2 \\ \hline 8 \end{array}$	$\begin{array}{r} 11 \\ -2 \\ \hline 9 \end{array}$
$\begin{array}{r} 3 \\ -3 \\ \hline 0 \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$	$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$	$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$	$\begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array}$	$\begin{array}{r} 10 \\ -3 \\ \hline 7 \end{array}$	$\begin{array}{r} 11 \\ -3 \\ \hline 8 \end{array}$	$\begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array}$
$\begin{array}{r} 4 \\ -4 \\ \hline 0 \end{array}$	$\begin{array}{r} 5 \\ -4 \\ \hline 1 \end{array}$	$\begin{array}{r} 6 \\ -4 \\ \hline 2 \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 10 \\ -4 \\ \hline 6 \end{array}$	$\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$	$\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$	$\begin{array}{r} 13 \\ -4 \\ \hline 9 \end{array}$
$\begin{array}{r} 5 \\ -5 \\ \hline 0 \end{array}$	$\begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$	$\begin{array}{r} 7 \\ -5 \\ \hline 2 \end{array}$	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	$\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$	$\begin{array}{r} 10 \\ -5 \\ \hline 5 \end{array}$	$\begin{array}{r} 11 \\ -5 \\ \hline 6 \end{array}$	$\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$	$\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$	$\begin{array}{r} 14 \\ -5 \\ \hline 9 \end{array}$
$\begin{array}{r} 6 \\ -6 \\ \hline 0 \end{array}$	$\begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$	$\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$	$\begin{array}{r} 11 \\ -6 \\ \hline 5 \end{array}$	$\begin{array}{r} 12 \\ -6 \\ \hline 6 \end{array}$	$\begin{array}{r} 13 \\ -6 \\ \hline 7 \end{array}$	$\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$
$\begin{array}{r} 7 \\ -7 \\ \hline 0 \end{array}$	$\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$	$\begin{array}{r} 10 \\ -7 \\ \hline 3 \end{array}$	$\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$	$\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$	$\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$	$\begin{array}{r} 14 \\ -7 \\ \hline 7 \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline 8 \end{array}$	$\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$
$\begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$	$\begin{array}{r} 9 \\ -8 \\ \hline 1 \end{array}$	$\begin{array}{r} 10 \\ -8 \\ \hline 2 \end{array}$	$\begin{array}{r} 11 \\ -8 \\ \hline 3 \end{array}$	$\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$	$\begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$	$\begin{array}{r} 14 \\ -8 \\ \hline 6 \end{array}$	$\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$	$\begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$
$\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$	$\begin{array}{r} 10 \\ -9 \\ \hline 1 \end{array}$	$\begin{array}{r} 11 \\ -9 \\ \hline 2 \end{array}$	$\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}$	$\begin{array}{r} 13 \\ -9 \\ \hline 4 \end{array}$	$\begin{array}{r} 14 \\ -9 \\ \hline 5 \end{array}$	$\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$	$\begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$	$\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$	$\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$

One Hundred Important Subtraction Questions

1.	6	1	9	5	9	11	7	10	9	15
	−3	−1	−3	−1	−4	−8	−3	−2	−2	−8
2.	4	3	7	8	6	8	10	8	11	10
	−3	−0	−4	−0	−2	−2	−7	−3	−3	−4
3.	0	6	10	5	14	7	10	8	14	14
	−0	−1	−9	−3	−7	−5	−6	−5	−6	−9
4.	2	4	8	7	5	9	12	13	15	13
	−2	−0	−1	−2	−0	−7	−3	−7	−7	−5
5.	2	7	1	6	4	10	12	17	15	17
	−1	−1	−0	−5	−4	−3	−6	−8	−6	−9
6.	3	6	9	11	5	6	13	9	12	11
	−2	−6	−5	−2	−5	−0	−9	−6	−8	−4
7.	7	9	10	9	6	3	11	12	12	14
	−0	−1	−5	−9	−4	−1	−6	−9	−7	−8
8.	7	9	8	8	8	5	12	13	16	16
	−6	−0	−7	−4	−8	−2	−4	−6	−9	−7
9.	4	10	7	4	16	10	11	13	15	13
	−2	−1	−7	−1	−8	−8	−5	−4	−9	−8
10.	9	2	3	8	5	11	18	11	12	14
	−8	−0	−3	−6	−4	−9	−9	−7	−5	−5

Eighty-One Multiplication Facts

$\begin{array}{r}1\\ \times 1\\ \hline 1\end{array}$	$\begin{array}{r}2\\ \times 1\\ \hline 2\end{array}$	$\begin{array}{r}3\\ \times 1\\ \hline 3\end{array}$	$\begin{array}{r}4\\ \times 1\\ \hline 4\end{array}$	$\begin{array}{r}5\\ \times 1\\ \hline 5\end{array}$	$\begin{array}{r}6\\ \times 1\\ \hline 6\end{array}$	$\begin{array}{r}7\\ \times 1\\ \hline 7\end{array}$	$\begin{array}{r}8\\ \times 1\\ \hline 8\end{array}$	$\begin{array}{r}9\\ \times 1\\ \hline 9\end{array}$
$\begin{array}{r}1\\ \times 2\\ \hline 2\end{array}$	$\begin{array}{r}2\\ \times 2\\ \hline 4\end{array}$	$\begin{array}{r}3\\ \times 2\\ \hline 6\end{array}$	$\begin{array}{r}4\\ \times 2\\ \hline 8\end{array}$	$\begin{array}{r}5\\ \times 2\\ \hline 10\end{array}$	$\begin{array}{r}6\\ \times 2\\ \hline 12\end{array}$	$\begin{array}{r}7\\ \times 2\\ \hline 14\end{array}$	$\begin{array}{r}8\\ \times 2\\ \hline 16\end{array}$	$\begin{array}{r}9\\ \times 2\\ \hline 18\end{array}$
$\begin{array}{r}1\\ \times 3\\ \hline 3\end{array}$	$\begin{array}{r}2\\ \times 3\\ \hline 6\end{array}$	$\begin{array}{r}3\\ \times 3\\ \hline 9\end{array}$	$\begin{array}{r}4\\ \times 3\\ \hline 12\end{array}$	$\begin{array}{r}5\\ \times 3\\ \hline 15\end{array}$	$\begin{array}{r}6\\ \times 3\\ \hline 18\end{array}$	$\begin{array}{r}7\\ \times 3\\ \hline 21\end{array}$	$\begin{array}{r}8\\ \times 3\\ \hline 24\end{array}$	$\begin{array}{r}9\\ \times 3\\ \hline 27\end{array}$
$\begin{array}{r}1\\ \times 4\\ \hline 4\end{array}$	$\begin{array}{r}2\\ \times 4\\ \hline 8\end{array}$	$\begin{array}{r}3\\ \times 4\\ \hline 12\end{array}$	$\begin{array}{r}4\\ \times 4\\ \hline 16\end{array}$	$\begin{array}{r}5\\ \times 4\\ \hline 20\end{array}$	$\begin{array}{r}6\\ \times 4\\ \hline 24\end{array}$	$\begin{array}{r}7\\ \times 4\\ \hline 28\end{array}$	$\begin{array}{r}8\\ \times 4\\ \hline 32\end{array}$	$\begin{array}{r}9\\ \times 4\\ \hline 36\end{array}$
$\begin{array}{r}1\\ \times 5\\ \hline 5\end{array}$	$\begin{array}{r}2\\ \times 5\\ \hline 10\end{array}$	$\begin{array}{r}3\\ \times 5\\ \hline 15\end{array}$	$\begin{array}{r}4\\ \times 5\\ \hline 20\end{array}$	$\begin{array}{r}5\\ \times 5\\ \hline 25\end{array}$	$\begin{array}{r}6\\ \times 5\\ \hline 30\end{array}$	$\begin{array}{r}7\\ \times 5\\ \hline 35\end{array}$	$\begin{array}{r}8\\ \times 5\\ \hline 40\end{array}$	$\begin{array}{r}9\\ \times 5\\ \hline 45\end{array}$
$\begin{array}{r}1\\ \times 6\\ \hline 6\end{array}$	$\begin{array}{r}2\\ \times 6\\ \hline 12\end{array}$	$\begin{array}{r}3\\ \times 6\\ \hline 18\end{array}$	$\begin{array}{r}4\\ \times 6\\ \hline 24\end{array}$	$\begin{array}{r}5\\ \times 6\\ \hline 30\end{array}$	$\begin{array}{r}6\\ \times 6\\ \hline 36\end{array}$	$\begin{array}{r}7\\ \times 6\\ \hline 42\end{array}$	$\begin{array}{r}8\\ \times 6\\ \hline 48\end{array}$	$\begin{array}{r}9\\ \times 6\\ \hline 54\end{array}$
$\begin{array}{r}1\\ \times 7\\ \hline 7\end{array}$	$\begin{array}{r}2\\ \times 7\\ \hline 14\end{array}$	$\begin{array}{r}3\\ \times 7\\ \hline 21\end{array}$	$\begin{array}{r}4\\ \times 7\\ \hline 28\end{array}$	$\begin{array}{r}5\\ \times 7\\ \hline 35\end{array}$	$\begin{array}{r}6\\ \times 7\\ \hline 42\end{array}$	$\begin{array}{r}7\\ \times 7\\ \hline 49\end{array}$	$\begin{array}{r}8\\ \times 7\\ \hline 56\end{array}$	$\begin{array}{r}9\\ \times 7\\ \hline 63\end{array}$
$\begin{array}{r}1\\ \times 8\\ \hline 8\end{array}$	$\begin{array}{r}2\\ \times 8\\ \hline 16\end{array}$	$\begin{array}{r}3\\ \times 8\\ \hline 24\end{array}$	$\begin{array}{r}4\\ \times 8\\ \hline 32\end{array}$	$\begin{array}{r}5\\ \times 8\\ \hline 40\end{array}$	$\begin{array}{r}6\\ \times 8\\ \hline 48\end{array}$	$\begin{array}{r}7\\ \times 8\\ \hline 56\end{array}$	$\begin{array}{r}8\\ \times 8\\ \hline 64\end{array}$	$\begin{array}{r}9\\ \times 8\\ \hline 72\end{array}$
$\begin{array}{r}1\\ \times 9\\ \hline 9\end{array}$	$\begin{array}{r}2\\ \times 9\\ \hline 18\end{array}$	$\begin{array}{r}3\\ \times 9\\ \hline 27\end{array}$	$\begin{array}{r}4\\ \times 9\\ \hline 36\end{array}$	$\begin{array}{r}5\\ \times 9\\ \hline 45\end{array}$	$\begin{array}{r}6\\ \times 9\\ \hline 54\end{array}$	$\begin{array}{r}7\\ \times 9\\ \hline 63\end{array}$	$\begin{array}{r}8\\ \times 9\\ \hline 72\end{array}$	$\begin{array}{r}9\\ \times 9\\ \hline 81\end{array}$

Eighty-One Important Multiplication Questions

1.	7 ×6	1 ×8	2 ×3	2 ×7	7 ×5	9 ×8	7 ×7	6 ×1	9 ×7
2.	6 ×3	8 ×8	2 ×2	7 ×9	5 ×3	7 ×4	3 ×1	6 ×8	9 ×2
3.	4 ×8	6 ×9	8 ×1	7 ×8	1 ×5	4 ×6	8 ×2	4 ×5	1 ×6
4.	1 ×2	8 ×4	4 ×3	5 ×7	3 ×2	5 ×6	1 ×9	7 ×1	9 ×6
5.	3 ×5	4 ×7	1 ×1	5 ×9	6 ×4	3 ×7	9 ×5	8 ×9	5 ×4
6.	4 ×1	9 ×4	3 ×3	3 ×6	5 ×8	2 ×4	7 ×2	1 ×4	3 ×8
7.	9 ×3	9 ×9	2 ×5	2 ×6	4 ×2	2 ×1	7 ×3	8 ×6	6 ×5
8.	2 ×9	5 ×1	4 ×9	6 ×7	5 ×2	3 ×4	5 ×5	2 ×8	9 ×1
9.	8 ×7	6 ×2	8 ×3	1 ×7	6 ×6	1 ×3	4 ×4	8 ×5	3 ×9

Eighty-One Division Facts

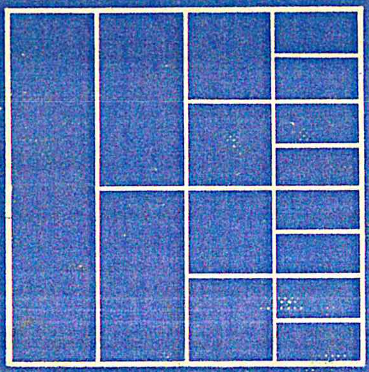
$\begin{array}{r}1\\1\overline{)1}\end{array}$	$\begin{array}{r}2\\1\overline{)2}\end{array}$	$\begin{array}{r}3\\1\overline{)3}\end{array}$	$\begin{array}{r}4\\1\overline{)4}\end{array}$	$\begin{array}{r}5\\1\overline{)5}\end{array}$	$\begin{array}{r}6\\1\overline{)6}\end{array}$	$\begin{array}{r}7\\1\overline{)7}\end{array}$	$\begin{array}{r}8\\1\overline{)8}\end{array}$	$\begin{array}{r}9\\1\overline{)9}\end{array}$
$\begin{array}{r}1\\2\overline{)2}\end{array}$	$\begin{array}{r}2\\2\overline{)4}\end{array}$	$\begin{array}{r}3\\2\overline{)6}\end{array}$	$\begin{array}{r}4\\2\overline{)8}\end{array}$	$\begin{array}{r}5\\2\overline{)10}\end{array}$	$\begin{array}{r}6\\2\overline{)12}\end{array}$	$\begin{array}{r}7\\2\overline{)14}\end{array}$	$\begin{array}{r}8\\2\overline{)16}\end{array}$	$\begin{array}{r}9\\2\overline{)18}\end{array}$
$\begin{array}{r}1\\3\overline{)3}\end{array}$	$\begin{array}{r}2\\3\overline{)6}\end{array}$	$\begin{array}{r}3\\3\overline{)9}\end{array}$	$\begin{array}{r}4\\3\overline{)12}\end{array}$	$\begin{array}{r}5\\3\overline{)15}\end{array}$	$\begin{array}{r}6\\3\overline{)18}\end{array}$	$\begin{array}{r}7\\3\overline{)21}\end{array}$	$\begin{array}{r}8\\3\overline{)24}\end{array}$	$\begin{array}{r}9\\3\overline{)27}\end{array}$
$\begin{array}{r}1\\4\overline{)4}\end{array}$	$\begin{array}{r}2\\4\overline{)8}\end{array}$	$\begin{array}{r}3\\4\overline{)12}\end{array}$	$\begin{array}{r}4\\4\overline{)16}\end{array}$	$\begin{array}{r}5\\4\overline{)20}\end{array}$	$\begin{array}{r}6\\4\overline{)24}\end{array}$	$\begin{array}{r}7\\4\overline{)28}\end{array}$	$\begin{array}{r}8\\4\overline{)32}\end{array}$	$\begin{array}{r}9\\4\overline{)36}\end{array}$
$\begin{array}{r}1\\5\overline{)5}\end{array}$	$\begin{array}{r}2\\5\overline{)10}\end{array}$	$\begin{array}{r}3\\5\overline{)15}\end{array}$	$\begin{array}{r}4\\5\overline{)20}\end{array}$	$\begin{array}{r}5\\5\overline{)25}\end{array}$	$\begin{array}{r}6\\5\overline{)30}\end{array}$	$\begin{array}{r}7\\5\overline{)35}\end{array}$	$\begin{array}{r}8\\5\overline{)40}\end{array}$	$\begin{array}{r}9\\5\overline{)45}\end{array}$
$\begin{array}{r}1\\6\overline{)6}\end{array}$	$\begin{array}{r}2\\6\overline{)12}\end{array}$	$\begin{array}{r}3\\6\overline{)18}\end{array}$	$\begin{array}{r}4\\6\overline{)24}\end{array}$	$\begin{array}{r}5\\6\overline{)30}\end{array}$	$\begin{array}{r}6\\6\overline{)36}\end{array}$	$\begin{array}{r}7\\6\overline{)42}\end{array}$	$\begin{array}{r}8\\6\overline{)48}\end{array}$	$\begin{array}{r}9\\6\overline{)54}\end{array}$
$\begin{array}{r}1\\7\overline{)7}\end{array}$	$\begin{array}{r}2\\7\overline{)14}\end{array}$	$\begin{array}{r}3\\7\overline{)21}\end{array}$	$\begin{array}{r}4\\7\overline{)28}\end{array}$	$\begin{array}{r}5\\7\overline{)35}\end{array}$	$\begin{array}{r}6\\7\overline{)42}\end{array}$	$\begin{array}{r}7\\7\overline{)49}\end{array}$	$\begin{array}{r}8\\7\overline{)56}\end{array}$	$\begin{array}{r}9\\7\overline{)63}\end{array}$
$\begin{array}{r}1\\8\overline{)8}\end{array}$	$\begin{array}{r}2\\8\overline{)16}\end{array}$	$\begin{array}{r}3\\8\overline{)24}\end{array}$	$\begin{array}{r}4\\8\overline{)32}\end{array}$	$\begin{array}{r}5\\8\overline{)40}\end{array}$	$\begin{array}{r}6\\8\overline{)48}\end{array}$	$\begin{array}{r}7\\8\overline{)56}\end{array}$	$\begin{array}{r}8\\8\overline{)64}\end{array}$	$\begin{array}{r}9\\8\overline{)72}\end{array}$
$\begin{array}{r}1\\9\overline{)9}\end{array}$	$\begin{array}{r}2\\9\overline{)18}\end{array}$	$\begin{array}{r}3\\9\overline{)27}\end{array}$	$\begin{array}{r}4\\9\overline{)36}\end{array}$	$\begin{array}{r}5\\9\overline{)45}\end{array}$	$\begin{array}{r}6\\9\overline{)54}\end{array}$	$\begin{array}{r}7\\9\overline{)63}\end{array}$	$\begin{array}{r}8\\9\overline{)72}\end{array}$	$\begin{array}{r}9\\9\overline{)81}\end{array}$

Eighty-One Important Division Questions

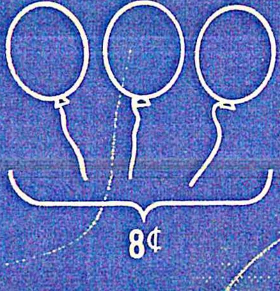
1.	$5\overline{)20}$	$7\overline{)56}$	$6\overline{)18}$	$9\overline{)72}$	$1\overline{)6}$	$3\overline{)21}$	$9\overline{)18}$
2.	$7\overline{)49}$	$5\overline{)45}$	$2\overline{)8}$	$4\overline{)20}$	$6\overline{)36}$	$1\overline{)1}$	$8\overline{)16}$
3.	$4\overline{)16}$	$3\overline{)3}$	$5\overline{)10}$	$6\overline{)6}$	$8\overline{)40}$	$2\overline{)4}$	$5\overline{)25}$
4.	$2\overline{)10}$	$3\overline{)9}$	$6\overline{)12}$	$1\overline{)5}$	$7\overline{)28}$	$5\overline{)15}$	$4\overline{)24}$
5.	$6\overline{)24}$	$1\overline{)7}$	$8\overline{)32}$	$9\overline{)27}$	$2\overline{)2}$	$9\overline{)54}$	$3\overline{)12}$
6.	$4\overline{)28}$	$8\overline{)24}$	$2\overline{)12}$	$7\overline{)21}$	$8\overline{)72}$	$3\overline{)6}$	$9\overline{)45}$
7.	$1\overline{)8}$	$7\overline{)14}$	$3\overline{)24}$	$9\overline{)9}$	$4\overline{)8}$	$6\overline{)42}$	$2\overline{)16}$
8.	$6\overline{)48}$	$7\overline{)7}$	$9\overline{)63}$	$2\overline{)6}$	$8\overline{)56}$	$1\overline{)2}$	$4\overline{)12}$
9.	$3\overline{)27}$	$6\overline{)54}$	$1\overline{)3}$	$5\overline{)35}$	$7\overline{)42}$	$2\overline{)18}$	$8\overline{)8}$
10.	$7\overline{)63}$	$9\overline{)36}$	$2\overline{)14}$	$4\overline{)4}$	$1\overline{)4}$	$5\overline{)30}$	$4\overline{)32}$
11.	$6\overline{)30}$	$3\overline{)15}$	$8\overline{)48}$	$7\overline{)35}$	$1\overline{)9}$	$9\overline{)81}$	
12.	$5\overline{)40}$	$3\overline{)18}$	$5\overline{)5}$	$4\overline{)36}$	$8\overline{)64}$		

Note: Pages 329 to 352 are not required for this book, so the back page images becomes the last page following Page 328.

On the original Page 346, the subject was about "Tables of Measures" describing the following: counting, length, liquid, dry, weight, and time. Pages 347 to 352 originally was the index.



SALE


8¢